

Semester End Regular/Supplementary Examination, February – 2023

Degree	B. Tech. (U. G.)	Program	ECE& EEE			Academic Year	2022 - 2023
Course Code	20ESX03	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	Basic Electrical Engineering						

Part A (Short Answer Questions 5 x 2 = 10 Marks)				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Draw the series circuit and parallel circuits.		20ESX03.1	L1
2	What is the role of commutator in DC machine?		20ESX03.2	L1
3	What are the types of transformer?		20ESX03.3	L1
4	Define the term synchronous speed.		20ESX03.4	L1
5	List any three applications of single phase AC motor.		20ESX03.5	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the classification of network elements.	6M	20ESX03.1	L2
6 (b)	Derive the star – Delta or Delta – Star transformation.	6M	20ESX03.1	L3
OR				
7 (a)	Explain Kirchoff's Current and Voltage Law in electric circuit with examples.	8M	20ESX03.1	L2
7 (b)	Derive the RMS value of the sinusoidal waveform.	4M	20ESX03.1	L3
8	Explain the working principle and operation of DC generator with necessary sketches.	12M	20ESX03.2	L2
OR				
9	Derive the torque equation of a DC motor. Also, mention the various speed control technique used in a DC motor operation.	12M	20ESX03.2	L3
10	Draw the constructional diagram of a single-phase transformer and explain the role of all the parts.	12M	20ESX03.3	L2
OR				
11	Explain open circuit and short circuit tests of transformer with neat circuit diagrams.	12M	20ESX03.3	L2
12	Explain the construction and working principle of alternator with necessary diagrams.	12M	20ESX03.4	L2
OR				
13	Describe the working principle of 3- Φ induction motor with necessary diagrams. Also draw the speed torque or slip torque characteristics curve.	12M	20ESX03.4	L2
14	Explain the working principle of capacitor start and shaded pole types of single phase induction motor with their applications.	12M	20ESX03.5	L2
OR				
15	Describe the working principle of AC servo motor with necessary diagrams.	12M	20ESX03.5	L2

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Degree	B. Tech.	Program	Civil Engg. & Mechanical Engg.	Academic Year	2022 - 2023
Course Code	20ESX01	Test Duration	3 Hrs.	Max. Marks	70
Course	Engineering Drawing				

Part A (Short Answer Questions 2 x 5 = 10 Marks)

No.	Questions (1 through 2)	Learning Outcome (s)	DoK
1	Draw the projections of points on the common reference line i. Point P is 35 mm behind the VP and 20 mm below the HP ii. Point Q is 30 mm above the HP and 40 mm in front of VP iii. Point R 50 mm behind the VP and 15 mm above the HP	20ESX01.2	L1
2	A hexagonal plane of side 25 mm having one of its sides in the HP & perpendicular to VP. Draw the projection of the lamina.	20ESX01.3	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 10)	Learning Outcome (s)	DoK
3 (a)	Construct a regular pentagon of 30 mm side by general method.	20ESX01.1	L2
3 (b)	Construct a hyperbola when the distance between the focus and directrix is 30 mm and eccentricity is 4/3. Also draw the tangent and normal to any point on the curve	20ESX01.1	L3

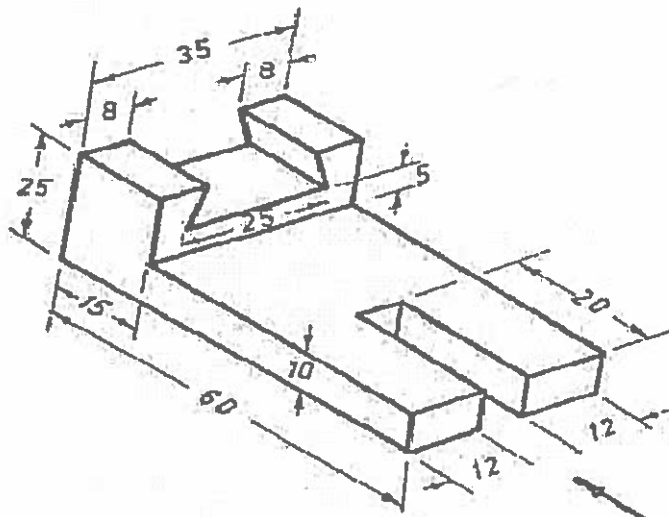
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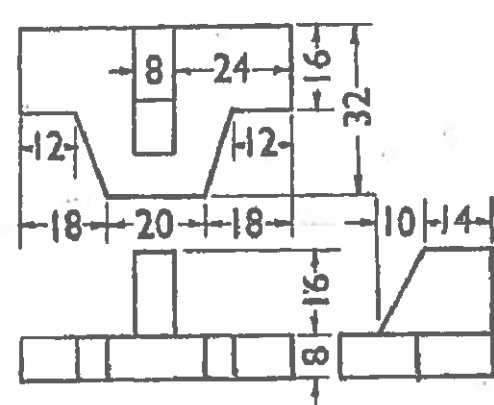
4 (a)	An area of 144 sq.cm on a map represents an area of 36 sq.km on the field. Find the R.F of the scale for this map and draw a diagonal scale to show kilometers, hectameters and decameters and to measure up to 10 kilometers. Indicate on the scale a distance of 7 kilometers, 5 hectometers and 6 decameters.	20ESX01.1	L3
4 (b)	Draw an ellipse by Oblong method. The major and minor axes given as 150 mm and 90 mm respectively. Draw normal and tangent at any point on the ellipse at a distance of 55 mm from the geometrical center of the ellipse.	20ESX01.1	L2
5 (a)	A line AB 65 mm long has its end A, 10 mm above HP and 25 mm in front of VP. It is inclined at 65° to HP and parallel to VP. Draw its projections. Also mark the traces.	20ESX01.2	L2
5 (b)	The midpoint of a straight line AB 90 mm long is 60 mm above HP and 50 mm in front of VP. It is inclined 45° to VP and 30° to HP. Draw the projections.	20ESX01.2	L3

OR

6 (a)	A line AB, 90 mm long, is inclined at 30 degrees to the HP and 20 mm in front of the VP. Its front view measures 65 mm. Draw the top view of AB and determine its inclination with the VP.	20ESX01.2	L3
6 (b)	A straight line is parallel to both VP and HP. Its one end is 25 mm behind VP and 15 mm above HP. Length of the line is 100 mm. Draw its projection.	20ESX01.2	L2
7 (a)	Draw a rhombus of diagonals 100 mm and 60 mm long, with the longer diagonal horizontal. The figure is the top view of a square of 100 mm long diagonals, with a corner on the ground. Draw its front view and determine the angle which its surface makes with the ground.	20ESX01.3	L3
7 (b)	A circular plate of diameter 70 mm has the end P of the diameter PQ in the HP and plate is inclined at 40° to the HP. Draw its projection a) The diameter PQ appears to be inclined at 45° to the VP in the top view b) The diameter PQ makes 45° with the VP.	20ESX01.3	L2

OR			
8 (a)	A regular hexagonal lamina with its edge 50 mm has its plane inclined at 45° to HP and lying with one of its edges in HP and perpendicular to VP. The corner nearest to VP is 15 mm in front of it. Draw its projections.	20ESX01.3	L2
8 (b)	A square lamina PQRS of side 40 mm rests on the ground on its corner P in such a way that the diagonal PR is inclined at 45° to the HP and parallel to VP. Draw its projections.	20ESX01.3	L3
9	A square prism of base side 30 mm and axis 70 mm rests on HP on one of its longer edges with the rectangular faces 45° inclined to HP and parallel to VP. Draw the top and front views of the prism.	20ESX01.4	L3
OR			
10	A pentagonal pyramid of base side 30 mm and axis length 60 mm is suspended by means of a string from one of its base corners with its axis parallel to VP. Draw its projections.	20ESX01.4	L3

11	<p>Draw the front view, top view and side view from the isometric view. All dimensions are in mm.</p> 	20ESX01.5	L4
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OR			
12	<p>Draw the isometric view of figure</p>  <p>(Third-angle projection)</p>	20ESX01.5	L4

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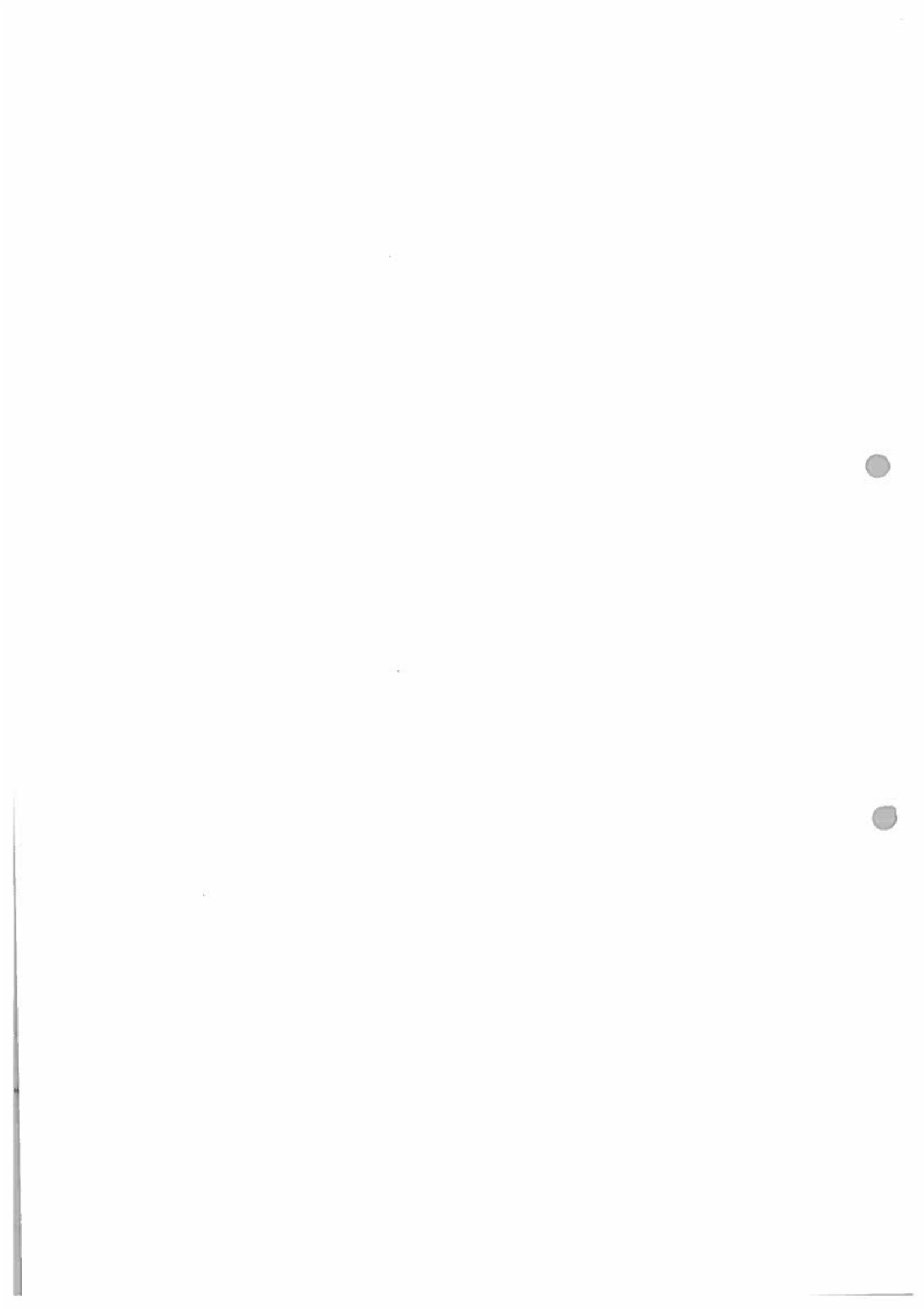
Degree	B. Tech.	Program	CSE, CSE (AI & ML) & CSE (DS)	Academic Year	2022- 2023
Course Code	20CS101	Test Duration	3 Hrs.	Max. Marks	70
Course	Fundamentals of Computer Science				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Differentiate between the characteristic of primary and secondary memory of computer.	20CS101.1	L2
2	Outline the flowchart for biggest among two numbers.	20CS101.2	L2
3	What is computer network?	20CS101.3	L1
4	Define database.	20CS101.4	L1
5	List any four applications of machine learning.	20CS101.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 10)	Marks	Learning Outcome (s)	DoK
6	Illustrate the various types of memory with suitable example.	12M	20CS101.1	L2
OR				
7 (a)	Explain in detail about the input and output devices.	6M	20CS101.1	L2
7 (b)	Discuss in detail the central processing unit with neat sketch.	6M	20CS101.1	L2
8	Illustrate the various looping statements used in C with suitable examples.	12M	20CS101.2	L2
OR				
9 (a)	Outline the flowchart for finding the biggest among 'n' numbers.	6M	20CS101.2	L2
9 (b)	Compare high level language and low level language.	6M	20CS101.2	L2
10	Name the four basic network topologies and explain them giving all the relevant features.	12M	20CS101.3	L2
OR				
11 (a)	Explain process life cycle with a neat diagram.	6M	20CS101.3	L2
11 (b)	Explain different operating systems.	6M	20CS101.3	L2
12	Explain the various applications of data base systems.	12M	20CS101.4	L2
OR				
13	Elaborate the following data base models i. Network model ii. Relational model	12M	20CS101.4	L2
14	Discuss the various foundational elements of artificial intelligence and applications of AI.	12M	20CS101.5	L2
OR				
15	Explain different types of machine learning with necessary illustrations.	12M	20CS101.5	L2



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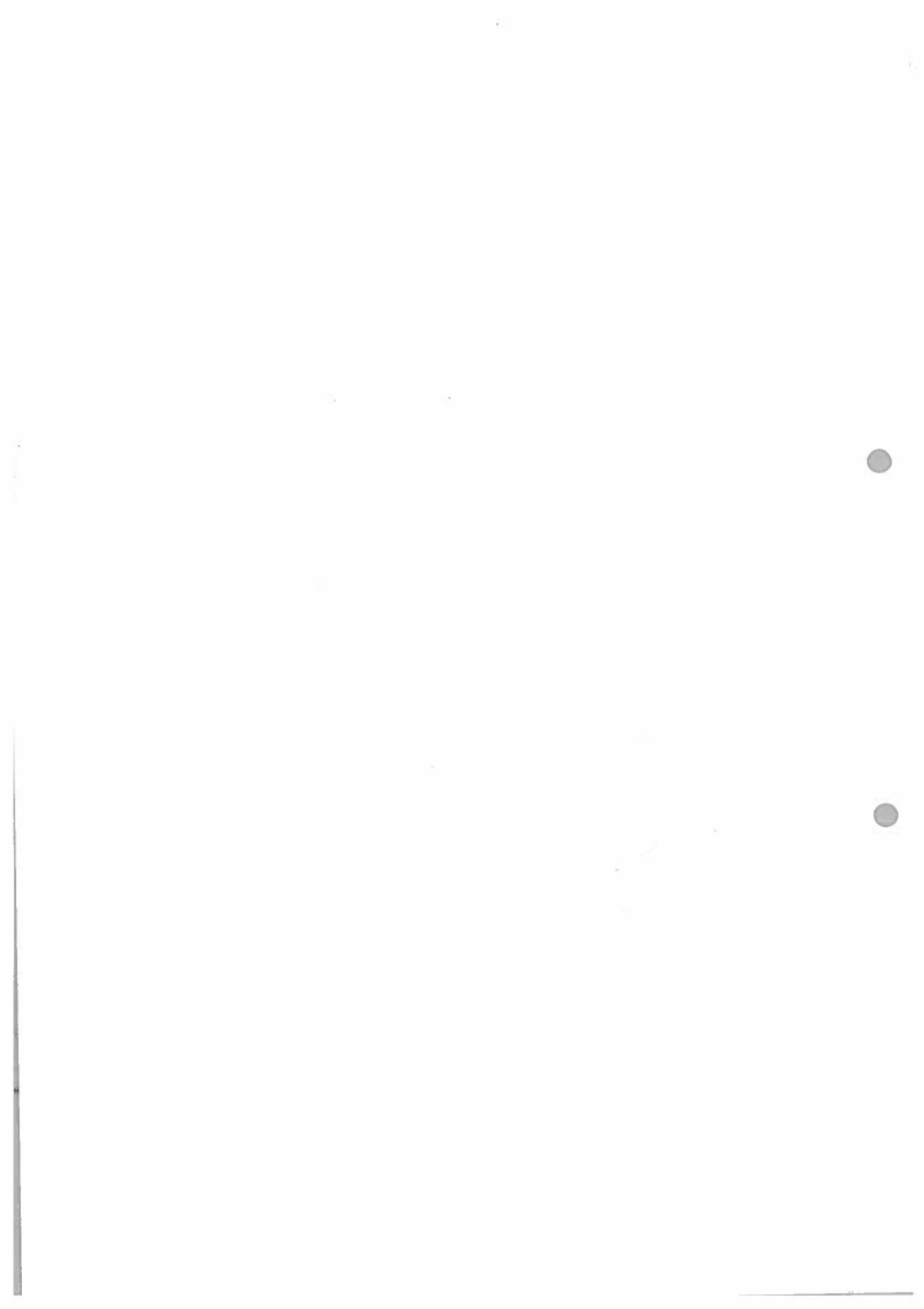
Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20BSX23	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	Applied Chemistry						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two examples of a bifunctional monomer.	20BSX23.1	L1
2	Indicate any two importance of salt bridge in an electrochemical cell.	20BSX23.2	L1
3	Write a formula for bond order calculation.	20BSX23.3	L1
4	List the two limitations of Beer-Lambert's law.	20BSX23.4	L1
5	What is meant by molecular modeling?	20BSX23.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

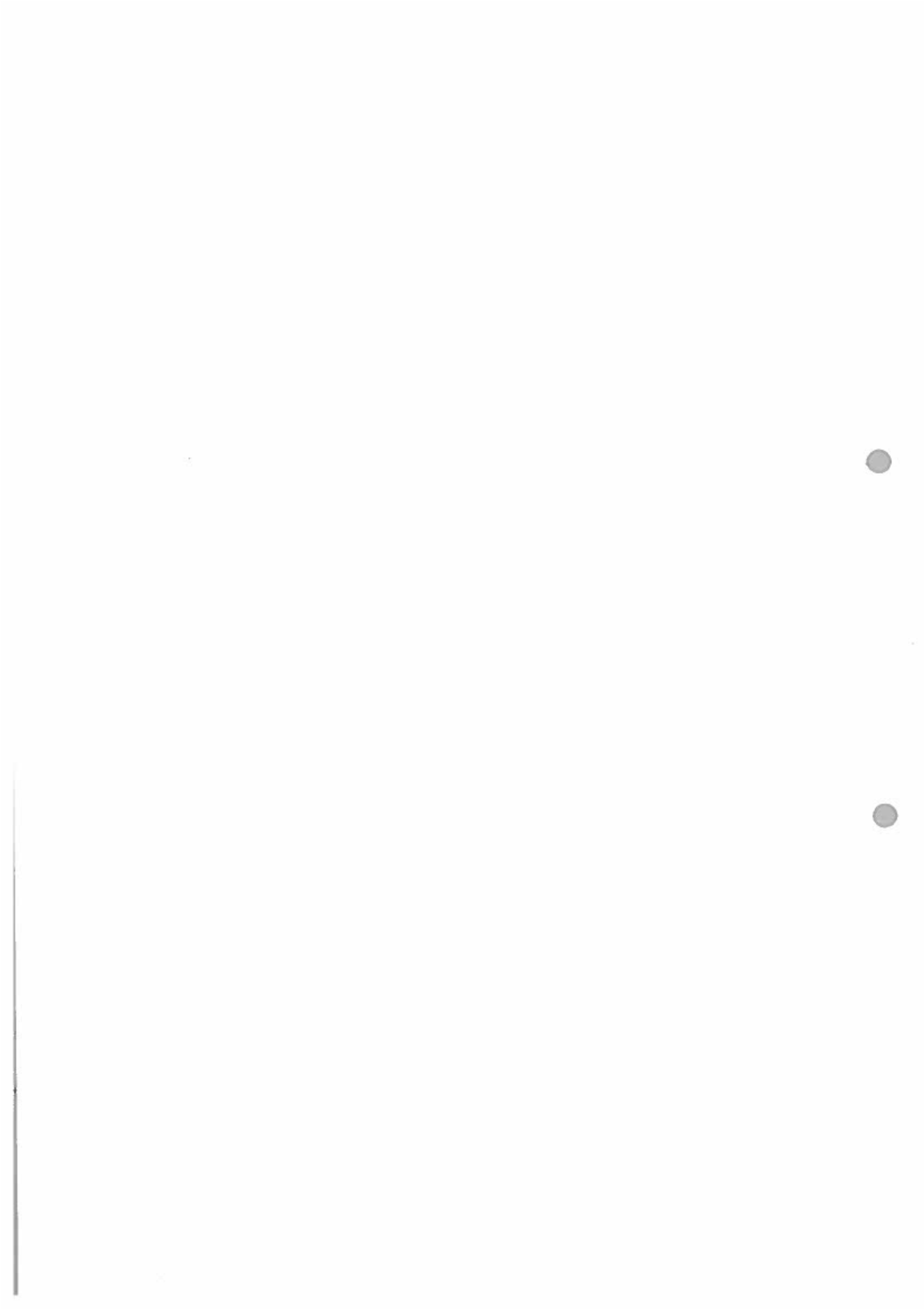
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Compare addition and condensation polymerization with two examples for each type.	6M	20BSX23.1	L2
6 (b)	What are phenolic - formaldehyde resins? Elaborate its preparation method.	6M	20BSX23.1	L2
OR				
7 (a)	Write the mechanism of free radical addition polymerization of ethylene.	6M	20BSX23.1	L2
7 (b)	What are conducting polymers? Write a note on the characteristics of conducting polymers.	6M	20BSX23.1	L2
8 (a)	Explain the construction and working of calomel electrode, with appropriate equations.	6M	20BSX23.2	L2
8 (b)	Derive the Nernst equation for a single electrode potential.	6M	20BSX23.2	L2
OR				
9 (a)	Explain the construction and working of Zinc - Air battery.	6M	20BSX23.2	L2
9 (b)	Describe the construction and working of Photovoltaic cell. List its two applications.	6M	20BSX23.2	L2
10 (a)	Explain the energy level diagram of CO molecule with their magnetic characteristic and bond order.	7M	20BSX23.3	L2
10 (b)	Illustrate the band diagrams of conductors, semiconductors and insulators	5M	20BSX23.3	L2
OR				
11 (a)	What is crystal field theory? Explain the crystal field splitting in octahedral complexes.	6M	20BSX23.3	L2
11 (b)	Explain the energy level diagram of O ₂ molecule with their magnetic characteristic and bond order.	6M	20BSX23.3	L2
12 (a)	Explain the principle and instrumentation of UV-visible spectroscopy with block diagram.	6M	20BSX23.4	L2
12 (b)	Summarize any six applications of Nuclear magnetic resonance spectroscopy.	6M	20BSX23.4	L2
OR				
13 (a)	Explain the principle and instrumentation of HPLC.	6M	20BSX23.4	L2
13 (b)	Demonstrate the process of acid-base titration through conductometric method.	6M	20BSX23.4	L2
14 (a)	Write a note on supra molecular reactivity and catalysis, Self-assembly in biological systems	7M	20BSX23.5	L2
14 (b)	How macrocyclic ligands are synthesized? Give an example.	5M	20BSX23.5	L2
OR				
15 (a)	Explain basic Lock and Key principles.	7M	20BSX23.5	L1
15 (b)	Write a note on cation, anion and simultaneous cation and anion bindings.	5M	20BSX23.5	L2



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Degree	B. Tech.	Program	CSE, CSE (AI & ML), CSE (DS) & EEE			Academic Year	2022 - 2023
Course Code	20BSX33	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	Applied Physics						

Part A (Short Answer Questions 5 x 2 = 10 Marks)				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	Define polarization		20BSX33.1	L1
2	List any two applications of LASER		20BSX33.2	L1
3	List any two applications of dielectric materials		20BSX33.3	L1
4	List any two properties of matter waves		20BSX33.4	L1
5	Define n - type semiconductor		20BSX33.5	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Quantitatively explain Newton's Ring experiment with interference concept and derive diameters for dark and bright rings	12M	20BSX33.1	L2
OR				
7 (a)	Describe the construction and working of Nicol prism	10M	20BSX33.1	L2
7 (b)	Define the phenomenon of double refraction	2M	20BSX33.1	L2
8 (a)	With a neat energy level diagram, exemplify the construction and working of ruby laser	10M	20BSX33.2	L2
8 (b)	List any two characteristics of laser	2M	20BSX33.2	L2
OR				
9 (a)	Derive acceptance angle and numerical aperture of optical fiber	10M	20BSX33.2	L2
9 (b)	Indicate the conditions required to achieve total internal reflection	2M	20BSX33.2	L2
10	Summarize the characteristics of magnetic materials	12M	20BSX33.3	L2
OR				
11 (a)	Discuss various types of polarization mechanisms in di-electrics	10M	20BSX33.3	L2
11 (b)	Define Di-electric constant	2M	20BSX33.3	L2
12	Formulate Schrodinger's time dependent and independent wave equations	12M	20BSX33.4	L2
OR				
13	Discuss merits and de-merits of classical free electron theory	12M	20BSX33.4	L2
14	Illustrate the motion of an electron in a periodic potential based on Kroning-Penney model	12M	20BSX33.5	L2
OR				
15	Define Hall Effect and derive an expression for Hall coefficient. List any two applications of Hall Effect	12M	20BSX33.5	L2



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Degree	B. Tech.	Program	Civil Engg. & Mechanical Engg.			Academic Year	2022 - 2023
Course Code	20BSX21	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	Engineering Chemistry						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Differentiate hard water from soft water	20BSX21.1	L2
2	List three uses of electrochemical series	20BSX21.2	L1
3	Indicate the composition and calorific value of LPG and CNG	20BSX21.3	L1
4	Define Polymer	20BSX21.4	L1
5	What is adsorption?	20BSX21.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Estimate the carbonate, non-carbonate, and total hardness of water by the EDTA method	6M	20BSX21.1	L1
6 (b)	Explain sludge and scale formation in boiler. Describe the disadvantages of scale and sludge formation	6M	20BSX21.1	L2

OR

7 (a)	Describe the demineralization of water by the ion-exchange process. How are exhausted cation and anion exchange resins regenerated?	6M	20BSX21.1	L1
7 (b)	Discuss the principle and salient features of desalination of water by reverse osmosis	6M	20BSX21.1	L2

8 (a)	Demonstrate the construction and working of a Calomel electrode. Write down its advantages and limitations	6M	20BSX21.2	L2
8 (b)	Illustrate the construction, cell reaction, and working of the MCFC electrode	6M	20BSX21.2	L2

OR

9 (a)	With suitable reactions, discuss the mechanism of electrochemical corrosion	6M	20BSX21.2	L2
9 (b)	Discuss the different constituents of paints	6M	20BSX21.2	L2

10 (a)	Calculate the HCV and LCV of a fuel having the following composition. 78% carbon, 4.2 % hydrogen, 1.4 % sulphur, 2.1% nitrogen and 2.2% ash	6M	20BSX21.3	L2
10 (b)	Explain the analysis of flue gas by Orsat apparatus	6M	20BSX21.3	L2

OR

11 (a)	Discuss briefly the following i. Octane rating ii. Cetane rating	6M	20BSX21.3	L2
11 (b)	Describe the Fischer Tropsch method for the synthesis of petrol	6M	20BSX21.3	L2

12 (a)	Explain the free radical mechanism of chain growth polymerization	6M	20BSX21.4	L2
12 (b)	Differentiate thermoplastics from thermosetting plastics	6M	20BSX21.4	L2

OR

13 (a)	Outline the preparation, properties and applications of Buna S rubber	6M	20BSX21.4	L2
13 (b)	Discuss the fiber and structural reinforced composites, enlist their engineering applications	6M	20BSX21.4	L2

14 (a)	What are nanomaterials? Explain any one electrochemical synthesis method for nanometals	7M	20BSX21.5	L2
14 (b)	How does the X-ray diffraction method describe the surface of a substance?	5M	20BSX21.5	L2
OR				
15 (a)	Enumerate the applications of nanomaterials and colloids	7M	20BSX21.5	L2
15 (b)	Give examples for the BET equation of surface analysis	5M	20BSX21.5	L2

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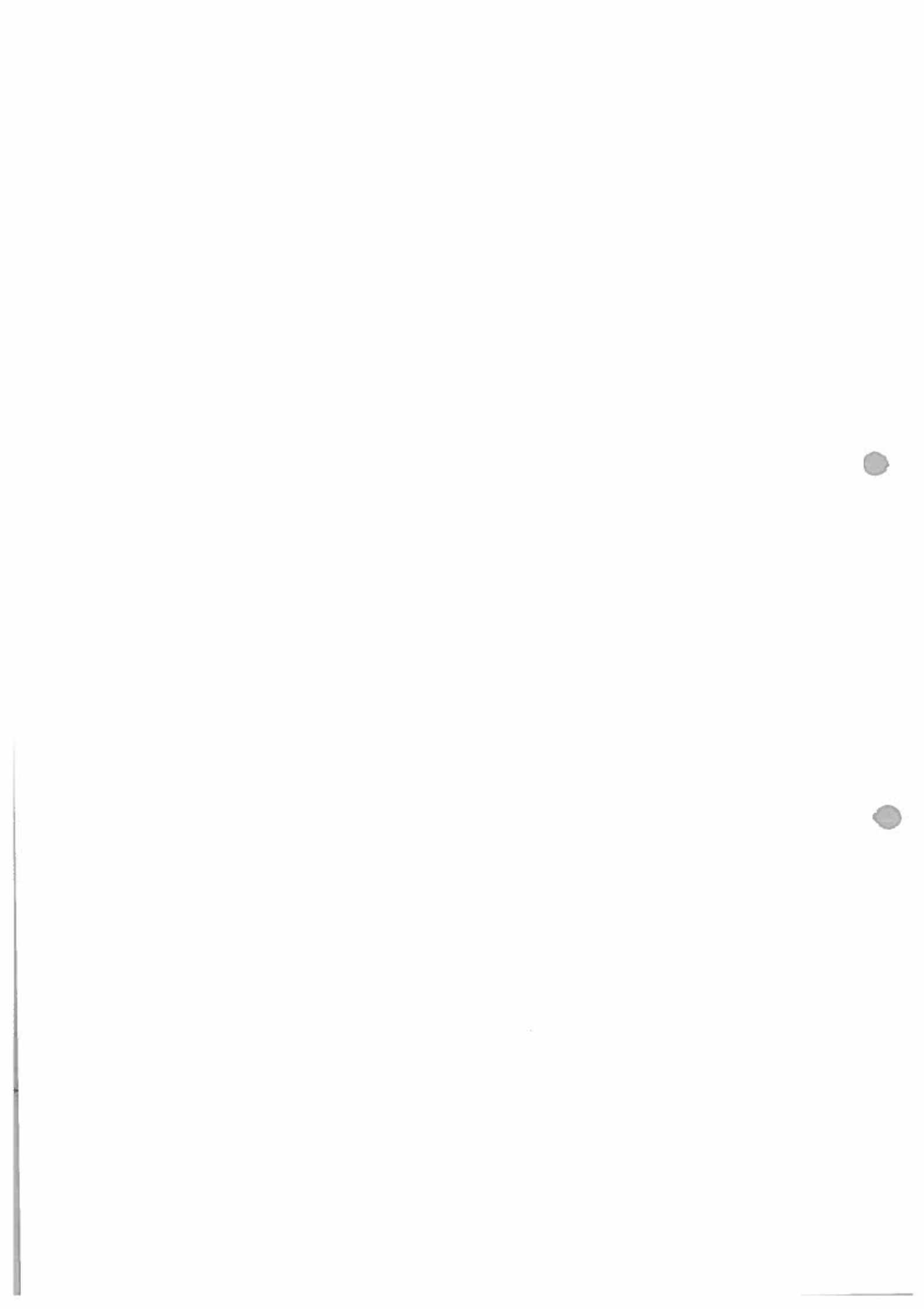
Degree	B. Tech. (U. G.)	Program	All Programs			Academic Year	2022 - 2023
Course Code	20ESX02	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	Programming for Problem Solving Using 'C'						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List the different data types available in C	20ESX02.1	L1
2	Recall the syntax of if-else statement	20ESX02.2	L1
3	How to declare and initialize 1-D AND 2-D array with an example?	20ESX02.3	L1
4	Distinguish between structure and union	20ESX02.4	L2
5	List any four file handling functions in C	20ESX02.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Develop a C program to find the sum of numbers from 1 to n	6M	20ESX02.1	L3
6 (b)	Outline the structure of C program with suitable example	6M	20ESX02.1	L2
OR				
7	Elaborate the various types of operators available in C with suitable example	12M	20ESX02.1	L2
8 (a)	Develop a C program to check whether a given number is even or odd	6M	20ESX02.2	L3
8 (b)	Develop a C program to find the factorial of a given number	6M	20ESX02.2	L3
OR				
9	Illustrate the various looping statements used in C with suitable examples	12M	20ESX02.2	L2
10 (a)	How to declare and initialize a two dimensional array? Discuss with an example	6M	20ESX02.3	L3
10 (b)	Illustrate the following string handling functions with suitable example i. strcpy() ii) strcmp() iii) strcat()	6M	20ESX02.3	L2
OR				
11	Explain the various function prototypes with suitable examples	12M	20ESX02.3	L2
12 (a)	Explain pointer with a suitable example	6M	20ESX02.4	L2
12 (b)	Discuss about the structure with an example	6M	20ESX02.4	L2
OR				
13	Develop a C program that defines a structure employee containing the details such as empno, empname, department name and salary. The structure has to store 10 employees in an organization. Use the appropriate method to define the above details and define a function that will display the contents	12M	20ESX02.4	L3
14	Explain the following file handling functions i. fseek() ii) ftell() iii) rewind() iv) feof()	12M	20ESX02.5	L2
OR				
15 (a)	Recall the syntax for opening a file with various modes and closing a file	6M	20ESX02.5	L1
15 (b)	Develop a C program to copy the contents from one file to another file	6M	20ESX02.5	L3



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Degree	B. Tech.	Program	Common to All			Academic Year	2022 - 2023
Course Code	20BSX11	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	Linear Algebra and Differential Equations						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Find the rank of $\begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 3 & 3 & 3 \end{bmatrix}$	20BSX11.1	L1
2	Write the nature of Q.F. $2x_1x_2 + 2x_1x_3 + 2x_2x_3$	20BSX11.2	L1
3	Find the integrating factor of the equation $\frac{dy}{dx} + 2x - 2y = 0$	20BSX11.3	L1
4	Solve $4\frac{d^3y}{dx^3} + 4\frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$	20BSX11.4	L1
5	State Rolle's theorem	20BSX11.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Find the rank of the matrix $A = \begin{bmatrix} 2 & 1 & -3 & -6 \\ 3 & -3 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{bmatrix}$ by reducing into normal form	6M	20BSX11.1	L2
6 (b)	Test for consistency and solve the equations $5x + 3y + 7z = 4$; $3x + 26y + 2z = 9$; $7x + 2y + 10z = 5$	6M	20BSX11.1	L3
OR				
7 (a)	Find the rank of the matrix $A = \begin{bmatrix} 1 & 3 & -1 & 2 \\ 0 & 11 & -5 & 3 \\ 2 & -5 & 3 & 1 \\ 4 & 1 & 1 & 5 \end{bmatrix}$ by reducing into Echelon form	6M	20BSX11.1	L2
7 (b)	Find the Eigen values and Eigen Vectors of $A = \begin{bmatrix} 3 & 10 & 5 \\ -2 & -3 & -4 \\ 3 & 5 & 7 \end{bmatrix}$	6M	20BSX11.1	L2
8	Prove that the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ satisfies Cayley Hamilton theorem and hence find A^{-1}	12M	20BSX11.2	L3
OR				
9	Reduce the quadratic form $8x^2 + 7y^2 + 3z^2 - 12xy - 8yz + 4zx$ to the canonical form specify the matrix of the transformation and hence find its Rank, Index, Signature, and nature of the quadratic form	12M	20BSX11.2	L3

10 (a)	Solve $x \frac{dy}{dx} + y = x^3 y^6$	6M	20BSX11.3	L2
10 (b)	Find the orthogonal trajectories of the family of the curves $r^n = a^n \cos n\theta$	6M	20BSX11.3	L3
OR				
11 (a)	Solve $xy(1 + xy^2) \frac{dy}{dx} = 1$	6M	20BSX11.3	L2
11 (b)	A bacterial population B is known to have a rate of growth proportional to B itself. If between noon and 2 PM the population triples, at what time, no controls being exerted, should B become 100 times what it was at noon?	6M	20BSX11.3	L3
OR				
12 (a)	Solve $(D^3 - 2D + 4)y = e^x \sin x$, where $D = \frac{d}{dx}$	6M	20BSX11.4	L2
12 (b)	Solve $(D^2 - 2D + 5)y = 0, y(0) = -3, y'(0) = 1$, where $D = \frac{d}{dx}$	6M	20BSX11.4	L3
OR				
13 (a)	Solve $(D^2 - 4D + 3)y = e^x \cos 2x$, where $D = \frac{d}{dx}$	6M	20BSX11.4	L2
13 (b)	Solve $(D^2 - 4D + 4)y = e^{2x} + \sin 3x$, where $D = \frac{d}{dx}$	6M	20BSX11.4	L3
OR				
14 (a)	Calculate approximately the root of the equation $x^4 - 12x + 7 = 0$ near 2 by using Lagrange's Mean Value theorem	6M	20BSX11.5	L2
14 (b)	Find the maximum and minimum distances from the origin to the curve $3x^2 + 4xy + 6y^2 = 140$ using Lagrange's Method of undetermined multipliers	6M	20BSX11.5	L3
OR				
15	If $x = r \sin\theta \cos\phi, y = r \sin\theta \sin\phi, z = r \cos\theta$ Then show that $\frac{\partial(x, y, z)}{\partial(r, \theta, \phi)} = r^2 \sin\theta$	12M	20BSX11.5	L3

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Semester End Regular/Supplementary Examination, February - 2023

Degree	B. Tech. (U. G.)	Program	Common to All			Academic Year	2022 - 2023
Course Code	20HSX01	Test Duration	3 Hrs.	Max. Marks	70	Semester	I
Course	Communicative English						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What progress has India made in the fifty years of Independence with reference to "Presidential Address" by Dr. A.P.J. Abdul Kalam?	20HSX01.1	L1
2	Write the meanings of the following words and use them in sentences. 1. Unruffled 2. Serene	20HSX01.2	L3
3	Differentiate Transitive and Intransitive verb with relevant examples each.	20HSX01.3	L2
4	Write any two phrasal verbs with appropriate examples.	20HSX01.4	L1
5	Give two examples of simple present tense with necessary rules.	20HSX01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 10)	Learning Outcome (s)	DoK
6 (a)	Analyze Kalam's "song of youth" as a mission statement.	20HSX01.1	L2
6 (b)	Fill in the blanks with appropriate form adding relevant prefix or suffix. a. He was acting in a very _____ way. (child) b. He wants to be a _____ when he grows up. (mathematics) c. The road was too narrow, so they had to _____ it. (wide) d. She looked _____. She started to cry. (happy) e. I think that you should _____ your decision. It may f. not be the best thing to do. (consider) g. You need a _____ of motivation, organization and hard h. work to realize your dreams. (combine)	20HSX01.1	L3
OR			
7 (a)	What is ironic about the way story ends?	20HSX01.1	L2
7 (b)	Pick out the adjectives and adverbs in the following sentences if they exist. Mention "No" if you don't find them in the given sentences. a. He spoke in a loud voice b. Do not talk so loudly c. It was a dangerous lake to swim in d. It was a magnificently beautiful performance e. He was a very sensible person f. She worked carefully with the sick child	20HSX01.1	L3
8 (a)	According to Pt. Nehru, how does a great leader help?	20HSX01.2	L1
8 (b)	Discuss the rules of <i>usage</i> and <i>omission</i> of article "The" with relevant examples. Write at least six rules for each element.	20HSX01.2	L2
OR			
9 (a)	Write short notes on following : a) Paraphrasing b) Summarizing c) Any three rules on article "an"	20HSX01.2	L2
9 (b)	What does the image of the sky suggest in the poem "Bosom	20HSX01.2	L1

	Friend"?		
10 (a)	What does Nadella predict for the future of technology?	20HSX01.3	L1
10 (b)	Explain the following terms with necessary examples. a) Homophones b) Homonyms c) Homographs	20HSX01.3	L2
OR			
11 (a)	As a member of your residential society, write an email to the inspector of local Police station, Mr. Sharma, informing him about miscreants who ride their bikes rashly every evening outside your society. Sign the email as William. Use the given phrases while composing mail. Phrases: Residential area – ride – rashly – children – play – elderly – walk – grocery shop – across the road – dangerous – accidents – nuisance – action – immediately.	20HSX01.3	L3
11 (b)	Write an essay on pollution.	20HSX01.3	L2
12 (a)	Read the following passage, identify the incorrect words and edit them. The Egyptian civilization were the first for make paper from Papyrus. The Papyrus material were a thick paper witch was used to write on during ancient times. Previously, this plants grew abundantly over the Nile Delta. The papyrus was also used to make hats, reed mats, etc.	20HSX01.4	L3
12 (b)	Use the following phrasal verbs into sentences. a) Sign off b) let down c) screw up d) Look forward e) Drop in f) Pop out	20HSX01.4	L3
OR			
13 (a)	Correct the following sentences if necessary. a. I am attending spoken English classes for two months b. One of my friend has placed in Infosys c. My father is going for a walk every day d. The English is the language of the English e. The police is looking for the culprit f. Ravi is more taller than Rakesh	20HSX01.4	L3
13 (b)	Design a poster on Skill India.	20HSX01.4	L3
14 (a)	Write an essay on "Still I Rise"	20HSX01.5	L2
14 (b)	Discuss the structures and usages of present and past tense with relevant sentence examples for each usage.	20HSX01.5	L2
OR			
15 (a)	Make your resume suitable for Microsoft .	20HSX01.5	L2
15 (b)	Choose the right form of the verbs for the given sentences. a. My son, along with two friends, (is, are) coming for the weekend b. Not only students, but also the teacher (has, have) been unhappy c. Either the photographer or her companions (was/were) the first to see the gorilla d. The news, about Afghanistan (is, are) shocking, isn't it e. The Whale Shark, the largest of all sharks, (grows /grows) up to 38 feet long f. The players, as well as the captain, (want, wants) to win	20HSX01.5	L3

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 - 2023

Degree	B. Tech.	Program	CE, EEE& MECH		Academic Year	2022 - 2023
Course Code	20BSX13	Test Duration	3 Hrs.	Max. Marks	70	Semester
Course	Numerical Methods & Transforms					III

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Prove that $(1 + \Delta)(1 - \nabla) = 1$	20BSX13.1	L1
2	Write the iteration formula for Jacobi's method	20BSX13.2	L1
3	Write Simpson's 3/8 th rule	20BSX13.3	L1
4	Find $L\{f(t)\}$	20BSX13.4	L1
5	State the Shifting property of Fourier transforms	20BSX13.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Solve the following equations by Gauss – Seidel method: $5x + 2y + z = 12, x + 4y + 2z = 15, x + 2y + 5z = 20$	6M	20BSX13.1	L2
6 (b)	Find a real root of the equation $3x - \cos x = 1$ by Newton - Raphson method, correct to three decimal places, near $x = 0.6$	6M	20BSX13.1	L2

OR

7	Find the root of the equation $x^3 - 2x - 5 = 0$, using bisection method, correct to three decimal places	12M	20BSX13.1	L2
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8	Using Lagrange's interpolation formula, find the value of y when $x = 9$, if the following values of x and y are given:	12M	20BSX13.2	L2												
	<table border="1"> <thead> <tr> <th>x</th> <td>5</td> <td>7</td> <td>11</td> <td>13</td> <td>17</td> </tr> <tr> <th>y</th> <td>150</td> <td>392</td> <td>1452</td> <td>2366</td> <td>5202</td> </tr> </thead> </table>	x	5	7	11	13	17	y	150	392	1452	2366	5202			
x	5	7	11	13	17											
y	150	392	1452	2366	5202											

OR

9	Find the number of men getting wages below Rs. 15 from the data	12M	20BSX13.2	L2										
	<table border="1"> <thead> <tr> <th>Wages in Rs.</th> <td>0-10</td> <td>10-20</td> <td>20-30</td> <td>30-40</td> </tr> <tr> <th>Frequency</th> <td>9</td> <td>30</td> <td>35</td> <td>42</td> </tr> </thead> </table>	Wages in Rs.	0-10	10-20	20-30	30-40	Frequency	9	30	35	42			
Wages in Rs.	0-10	10-20	20-30	30-40										
Frequency	9	30	35	42										

10 (a)	Evaluate $\int_0^6 \frac{1}{1+x^2} dx$ by using Trapezoidal rule, by dividing the interval (0, 6) into 6 parts	6M	20BSX13.3	L2
10 (b)	Solve $y' = x^2 y - 1, y(0) = 1$ using Euler's series method and compute $y(0.1)$. Take $h = 0.02$	6M	20BSX13.3	L3

OR

11 (a)	Evaluate $\int_0^1 \frac{1}{x} dx$ by Simpson's $\frac{1}{3}$ rd rule with 4 subintervals	6M	20BSX13.3	L2
11 (b)	Using Runge-Kutta method, evaluate $y(0.1)$ given that $y' = x + y^2, y(0) = 1$	6M	20BSX13.3	L3
12 (a)	Show that $\int_0^\infty e^{-2t} \cos 3t dt = \frac{2}{13}$	4M	20BSX13.4	L2

12 (b)	Using convolution theorem, evaluate $L^{-1} \left(\frac{s}{(s^2 + a^2)^2} \right)$	8M	20BSX13.4	L3
OR				
13 (a)	Evaluate Laplace transform of $\frac{\cos at - \cos bt}{t}$	6M	20BSX13.4	L2
13 (b)	Solve $y'' + 4y' + 3y = e^{-t}$, if $y(0) = y'(0) = 1$ using transform method	6M	20BSX13.4	L3
OR				
14	Find the Fourier sine and cosine transform of $f(x) = \begin{cases} x, & \text{for } 0 < x < 1 \\ 2 - x, & \text{for } 1 < x < 2 \\ 0, & \text{for } x > 2 \end{cases}$	12M	20BSX13.5	L2
OR				
15	Find the Fourier integral of $f(x) = \begin{cases} 1 & \text{for } x < 1 \\ 0 & \text{for } x > 1 \end{cases}$	12M	20BSX13.5	L2

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 - 2023

Degree	B. Tech	Program	ECE	Academic Year	2022 - 2023
Course Code	20BSX14	Test Duration	3 Hrs.	Max. Marks	70
Course	Complex Variables & Transforms		Semester	III	

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Harmonic function	20BSX14.1	L1
2	Find the poles of $\frac{z+1}{z^2+1}$	20BSX14.2	L2
3	State Euler's formula	20BSX14.3	L2
4	Find the Laplace transform of $1 \cdot e^t$	20BSX14.4	L1
5	Define inverse Fourier transform	20BSX14.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Determine the analytic function $f(z) = u + iv$, if $u - v = \frac{\cos x + \sin x - e^{-y}}{2(\cos x - \cosh y)}$ and $f\left(\frac{\pi}{2}\right) = 0$	6M	20BSX14.1	L3
6 (b)	If $f(z)$ is an analytic function with constant modulus, show that $f(z)$ is constant	6M	20BSX14.1	L2
OR				
7 (a)	Find the regular function whose imaginary part is $v = \log(x^2 + y^2) + x - 2y$	6M	20BSX14.1	L2
7 (b)	Use Cauchy's integral formula to calculate $\oint_C \frac{\sin \pi z + \cos \pi z}{(z-1)(z-2)} dz$ where C is $ z = 4$	6M	20BSX14.1	L3
8 (a)	Find the Laurents series expansion of $f(z) = \frac{7z-2}{(z+1)z(z-2)}$ in the region $1 < z+1 < 3$	6M	20BSX14.2	L2
8 (b)	Find the residue of the function $\frac{ze^z}{(z-1)^2}$ at the each pole	6M	20BSX14.2	L3
9 (a)	Evaluate $\oint_C \frac{z^2+4}{z^3+2z^2+2z} dz$, where C is the circle given by (i) $ z = 1$; (ii) $ z+1-i = 1$; (iii) $ z+i+1 = 1$; (iv) $ z-1 = 5$	6M	20BSX14.2	L2
9 (b)	Find Laurent's series of $f(z) = \frac{e^z}{z(1-z)}$ about $z=1$. Find the region converges	6M	20BSX14.2	L3
10 (a)	Find a Fourier series to represent $x - x^2$ from $x = -\pi$ to $x = \pi$	6M	20BSX14.3	L2
10 (b)	Expand $f(x) = \sqrt{1 - \cos x}$, when $0 < x < 2/5$	6M	20BSX14.3	L3

	is a Fourier series. Hence evaluate $\frac{1}{1.3} + \frac{1}{3.5} + \frac{1}{5.7} + \dots$		
OR			
11 (a)	Find the Fourier series expansion of $f(x) = 2x - x^2$ in $(0,3)$ and hence deduce that $\frac{1}{1^2} + \frac{1}{2^2} + \dots = \frac{\pi^2}{6}$	6M	20BSX14.3
11 (b)	Obtain a half-range cosine series for consider $f(x) = \pi - x$ in $0 < x < \pi$. Hence show that $\sum_{r=0}^{\infty} \frac{1}{(2r+1)^2} = \frac{\pi^2}{8}$	6M	20BSX14.3
OR			
12 (a)	Find the Laplace transform of $\frac{\cos at - \cos bt}{t} + t \sin at$	6M	20BSX14.4
12 (b)	Apply convolution theorem to solve $\frac{s^2}{(s^2+a^2)(s^2+b^2)}$	6M	20BSX14.4
OR			
13 (a)	Find the inverse Laplace transform of $\frac{s}{s^4+4a^4}$	6M	20BSX14.4
13 (b)	Using the Laplace transform method to solve $(D^2 - 3D + 2)y = 4e^{2t}$ with $y(0) = 3; y'(0) = 5$	6M	20BSX14.4
OR			
14 (a)	Find the Fourier cosine transform of x Find the Fourier transform	6M	20BSX14.5
14 (b)	$f(x) = \begin{cases} a^2 - x^2 & \text{for } x \leq a \\ 0 & \text{for } x > a \end{cases}$ Hence deduce that $\int_0^{\infty} \frac{\sin t - t \cos t}{t^3} dt = \frac{\pi}{4}$	6M	20BSX14.5
OR			
15 (a)	Find the Fourier Cosine transform of $e^{-\alpha x}$ Hence evaluate $\int_0^{\infty} \frac{\cos tx}{x^2+\alpha^2} dx$	6M	20BSX14.5
15 (b)	Show that the inverse finite Fourier sine transform of $F_n(x) = \frac{1}{\pi} \left\{ 1 + \cos n\pi - 2\cos \frac{n\pi}{2} \right\}$ is $f(x) = \begin{cases} 1 & 0 < x < \pi/2 \\ -1 & \frac{\pi}{2} < x < \pi \end{cases}$	6M	20BSX14.5

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 – 2023

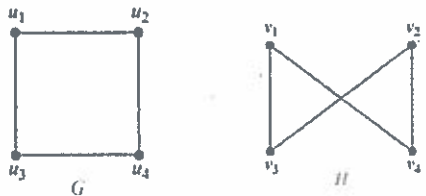
Degree	B. Tech.	Program	CSE, CSE(AI & ML), CSE(DS)	Academic Year	2022 - 2023
Course Code	20BSX16	Test Duration	3 Hrs. Max. Marks 70	Semester	III
Course	Mathematical Foundations of Computer Science				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Conjunction. Explain with truth table and suitable example	20BSX16.1	L1
2	Show that the relation divides ($/$) is a partial ordering on the set of integers	20BSX16.2	L2
3	What are the quotient and remainder when -22 is divided by 3?	20BSX16.3	L1
4	Find the first three terms in the sequence defined by the recurrence relation $a_n = 3 a_{n-1}$ with initial condition $a_1 = 2$	20BSX16.4	L2
5	How many edges are there in a graph with 10 vertices each of degree six?	20BSX16.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Define Tautology, Contradiction, contingency with examples	6M	20BSX16.1	L2
6 (b)	Construct the truth table of the compound proposition $(p \vee \sim q) \rightarrow (p \wedge q)$	6M	20BSX16.1	L3
OR				
7 (a)	(i) Obtain the Disjunctive Normal form of $\sim P \rightarrow (Q \wedge R)$ (ii) Obtain the Conjunctive Normal form of $P \wedge (P \rightarrow Q)$	6M	20BSX16.1	L2
7 (b)	If there was a ball game, then traveling was difficult. If they arrived on time, then traveling was not difficult. They arrived on time. Therefore, there was no ball game'. Show that these statements constitute a valid argument	6M	20BSX16.1	L3
8 (a)	Write the matrix representation and directed graph of the relation on the set $A = \{1, 2, 3, 4\}$ where $R = \{(1, 1), (1, 2), (2, 1), (2, 2), (2, 4), (3, 3), (3, 1), (4, 3), (4, 1), (3, 2)\}$	6M	20BSX16.2	L3
8 (b)	Construct the Hasse diagram for the partial ordering $\{(A, B) \mid A \subseteq B\}$ on the power set $P(S)$ where $S = \{a, b, c\}$	6M	20BSX16.2	L2
OR				
9 (a)	Let $S = \{1, 2, 3, 4\}$ and let $f = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \end{pmatrix}$ and $g = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 1 & 2 & 3 \end{pmatrix}$. Find $f \circ g$, $g \circ f$, f^{-1} and g^{-1} in the permutation form.	6M	20BSX16.2	L3
9 (b)	Define group and prove that Fourth root unity $G = \{1, -1, i, -i\}$ is an abelian group.	6M	20BSX16.2	L2
10 (a)	State and prove Euler's theorem.	6M	20BSX16.3	L2
10 (b)	Find the prime factorization of 243, 125 and 289.	6M	20BSX16.3	L3
OR				
11 (a)	State and prove Fermat's theorem.	6M	20BSX16.3	L2
11 (b)	Find the gcd of 1001 and 1331, and find the integers x and y such that $\text{gcd}(1001, 1331) = 1001x + 1331y$.	6M	20BSX16.3	L3

12 (a)	Find the solution of the recurrence relation $a_{n+2} - 4 a_{n+1} + 4 a_n = 2n$?	6M	20BSX16.4	L3
12 (b)	Find the solution to the recurrence relation $a_n = 6a_{n-1} - 8 a_{n-2}$ for $n \geq 2$, $a_0 = 4$, $a_1 = 10$	6M	20BSX16.4	L3
OR				
13 (a)	Solve the recurrence relation $a_n = 6 a_{n-1} - 9 a_{n-2}$, with $a_0 = 1$, $a_1 = 6$	6M	20BSX16.4	L2
13 (b)	Find the explicit formula for the Fibonacci numbers with $F_0 = 0$, $F_1 = 1$	6M	20BSX16.4	L1
14 (a)	Define Eulerian and Hamiltonian Graphs with suitable examples. Show that the following two graphs G and H are isomorphic	6M	20BSX16.5	L1
14 (b)		6M	20BSX16.5	L2
OR				
15 (a)	Explain Prim's algorithm to find minimal spanning tree of the graph with suitable example	6M	20BSX16.5	L2
15 (b)	Explain Kruskal's algorithm to find minimal spanning tree of the graph with suitable example	6M	20BSX16.5	L2

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 - 2023

Degree	B. Tech. (U. G.)	Program	Civil Engineering			Academic Year	2022 - 2023
Course Code	20CE302	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Building Planning And Drawing						

Part A (Short Answer Questions 14 x 3 = 42 Marks)

No.	Questions (1 through 5)	Marks	Learning Outcome (s)	DoK
1 (a)	Explain the importance of dimensioning & conventional representations in the drawing and draw the conventional signs for the following :- i) Stone ii) Concrete iii) Plywood iii) Glass iv) Steel	7 M	20CE302.1	L2
1 (b)	Draw 1 ½ brick English bond with plan and elevation	7 M	20CE302.1	L2
2 (a)	Write in detail about for guidelines for planning the buildings to suit their functional requirements	7 M	20CE302.2	L2
2 (b)	List out the bye- laws and regulations which include all the features of various types of buildings	7 M	20CE302.2	L2
3 (a)	Write in detail about the orientation of buildings	7 M	20CE302.3	L2
3 (b)	In any residential building, what are the essentials which need to be considered while planning?	7 M	20CE302.3	L2
4 (a)	Name any four types of truss and sketch any one	7 M	20CE302.4	L2
4 (b)	Draw the elevation of a glazed window	7 M	20CE302.4	L3
5 (a)	Draw the layout for the residential building	8 M	20CE302.5	L3
5 (b)	Explain the principle of planning a hospital	6 M	20CE302.5	L2

Part B (Long Answer Questions 1 x 28 = 28 Marks)

No.	Questions (6 through 7)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw the layout of panelled door.	10 M	20CE302.4	L3
6 (b)	Draw the king post truss for a span of 10 m.	18 M	20CE302.4	L3
7	For the given line diagram from fig.1. Develop a plan and elevation of residential building. Take external wall thickness as 30 cm and internal wall 20 cm.	28 M	20CE302.5	L3

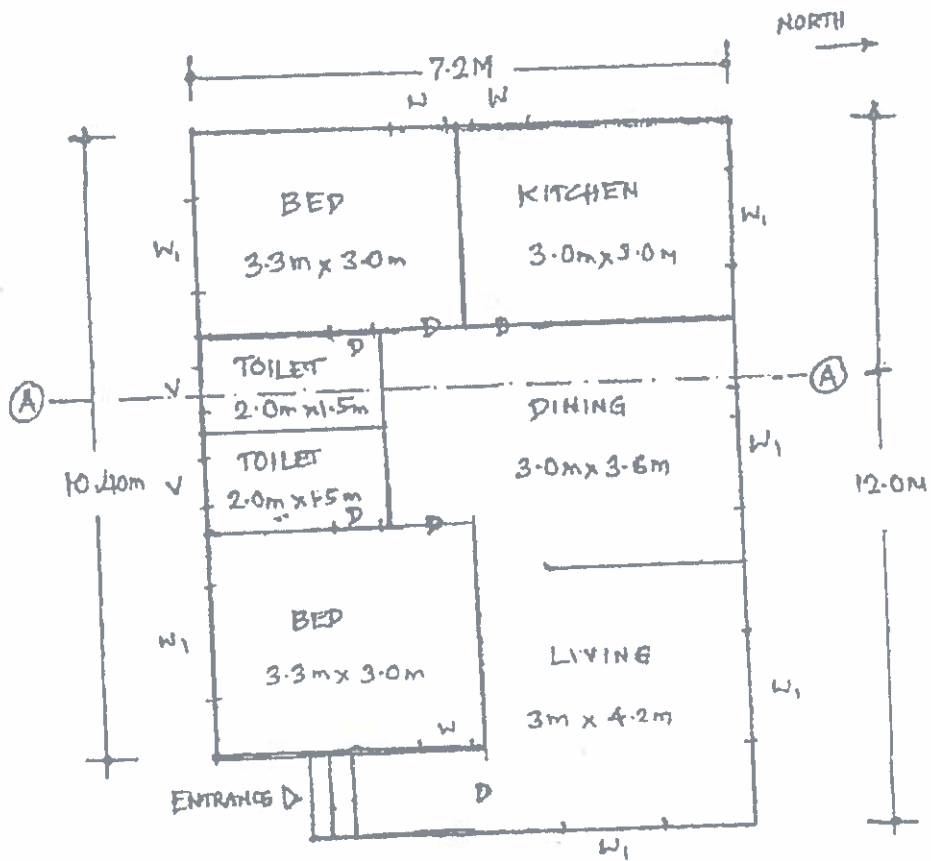


Fig.Q1

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Semester End Regular/Supplementary Examination, Dec/Jan., 2022 - 2023

Degree	B. Tech. (U. G.)	Program	Mechanical Engineering	Academic Year	2022 - 2023
Course Code	20ME301	Test Duration	3 Hrs. Max. Marks 70	Semester	III
Course	Thermodynamics				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define an open and closed system	20ME301.1	L1
2	Define the term internal energy and enthalpy	20ME301.2	L1
3	Define the term COP	20ME301.3	L1
4	Define Boiling point and Melting point	20ME301.4	L1
5	What is compressibility factor?	20ME301.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	With neat sketch, explain about constant volume gas thermometer	6M	20ME301.1	L2
6 (b)	Derive the pdV - work expression for isothermal ($pV = C$) and polytropic ($pV^n = C$) quasi-static processes	6M	20ME301.1	L3

OR

7 (a)	A gas expands from an initial state with $p_1 = 340$ kPa and $V_1 = 0.0425$ m ³ to a final state where $p_2 = 136$ kPa. If the pressure-volume relationship during the process is $PV^2 = \text{Constant}$, Determine the work in kJ	7M	20ME301.1	L3
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7 (b)	A platinum resistance thermometer has a resistance of 2.8Ω at 0°C and 3.8Ω at 100°C . Calculate the temperature when the resistance indicated is 5.8Ω	5M	20ME301.1	L3
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8 (a)	Air enters a compressor with a velocity of 60 m/s, pressure 100 kPa, temperature 40°C and leaves the compressor with a velocity of 90 m/s, 500 kPa and 120°C . Consider the system is adiabatic. Find the power of motor for the mass flow rate of 40 kg/min. Write the assumption made.	10M	20ME301.2	L3
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8 (b)	Write down the simplified steady flow energy equation for steam turbine	2M	20ME301.2	L1
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OR

9 (a)	Using first law of thermodynamics, prove that the difference in specific heat capacities ($C_p - C_v$) = gas constant (R)	8M	20ME301.2	L3
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9 (b)	What is PMM1? Why it is impossible?	4M	20ME301.2	L1
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10 (a)	With neat sketch, state Kelvin-Planck and Clausius statement of Second law of thermodynamics	6M	20ME301.3	L2
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10 (b)	A refrigerator removes heat from a refrigerated space at 2°C at a rate of 300 kJ/min and rejects heat to kitchen air at 26°C at a rate of 345 kJ/min. Verify whether it violates II law of thermodynamics by Clausius inequality and Carnot theorem	6M	20ME301.3	L3
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OR

11 (a)	Two Carnot engines A and B are operated in series. The first one (A) receives heat at 870 K and rejects to a reservoir at temperature T . The second engine (B) receives the heat rejected by the first engine and in turn rejects to a heat reservoir at 300 K. Calculate the temperature T in $^\circ\text{C}$ for the following cases. (i) The work output of the two engines are equal (ii) The efficiencies of the two engines are equal	8M	20ME301.3	L3
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11 (b)	A Carnot engine works between 300°C and 30°C . The heat supplied to the engine is 20 kJ. Determine (i) efficiency (ii) Work output and (iii) Heat rejection	4M	20ME301.3	L3
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12 (a)	A boiler generates steam at 3 bar and 0.85 dry from water at 45 °C, 540 kJ/s heat is added during the evaporation. Calculate the amount of steam generated per hour.	4M	20ME301.4	L3
12 (b)	Draw the p-v diagram of pure substances and explain various regions of the diagram in detail	8M	20ME301.4	L2
OR				
13 (a)	Ten kg of water at 45 °C is heated at a constant pressure of 10 bar until it becomes superheated vapour at 300 °C. Find the change in volume, enthalpy, internal energy, and entropy.	4M	20ME301.4	L3
13 (b)	Discuss about h-s and T-s diagram for a pure substance	8M	20ME301.4	L2
14 (a)	Compute the specific volume of steam at 0.9 bar and 550 K using Vander Waal's equation. Take critical temperature of steam is 647.3 K and critical pressure is 220.9 bar, Molecular weight of steam is 18 g/mol	5M	20ME301.5	L3
14 (b)	A tank of 1 m ³ capacity originally contains O ₂ at a pressure of 5 bar and 350 K. Nitrogen is introduced without change in temperature until the pressure in the tank becomes 12 bar. Determine the mass of each gas in the tank and partial volume of each gas.	7M	20ME301.5	L3
OR				
15 (a)	Discuss about vander-Waal's equation of state and its limitations	6M	20ME301.5	L2
15 (b)	Define the following: (i) Specific Humidity (ii) Relative Humidity (iii) Absolute Humidity	6M	20ME301.5	L1

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Semester End Regular/Supplementary Examination, Dec. /Jan., 2022 - 2023

Degree	B. Tech. (U. G.)	Program	EEE & ECE			Academic Year	2022 - 2023
Course Code	20EC302	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Electronic Devices and Circuits						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write any 2 applications of PN-junction diode.	20EC302.1	L1
2	Draw Zener Diode Characteristics.	20EC302.2	L1
3	Compare CE, CC and CB configurations.	20EC302.3	L1
4	What is thermal run away?	20EC302.4	L1
5	Mention small signal parameters of JFET.	20EC302.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Derive the current diode equation.	6M	20EC302.1	L2
6 (b)	What is the P-N junction? Discuss the behavior of a P-N junction under forward and reverse bias.	6M	20EC302.1	L2
OR				
7 (a)	Describe the current components in P-N diode.	6M	20EC302.1	L2
7 (b)	What is the effect of temperature on P-N junction diode?	6M	20EC302.1	L1
8 (a)	Compare the characteristics of PN junction diode, Zener Diode and Tunnel diode.	6M	20EC302.2	L2
8 (b)	Draw the equivalent circuit of UJT and discuss its working from the circuit.	6M	20EC302.2	L2
OR				
9 (a)	Explain the operation of Full Wave Rectifier with necessary graphs	6M	20EC302.2	L2
9 (b)	Explain the operation of (i) Inductor filter (ii) capacitor filter	6M	20EC302.2	L2
10 (a)	Explain the drain and transfer characteristics of a N-Channel JFET.	5M	20EC302.3	L2
10 (b)	Sketch the family of CE output characteristics for a transistor. Explain cutoff, active, saturation region.	7M	20EC302.3	L2
OR				
11 (a)	Define α and β of a transistor and derive the relationship between them.	4M	20EC302.3	L2
11 (b)	Explain the operation of n-p-n BJT with CE input and output characteristics.	8M	20EC302.3	L2
12 (a)	Obtain an expression of stability factor for fixed bias.	5M	20EC302.4	L2
12 (b)	What is Biasing? Explain the need of it. List out different types of biasing methods.	7M	20EC302.4	L2
OR				
13 (a)	In a Silicon transistor circuit with a fixed bias, $V_{CC}=9V$, $R_C=3K\Omega$, $R_B=8K\Omega$, $\beta=50$, $V_{BE}=0.7V$. Find the operating point and Stability factor.	6M	20EC302.4	L3
13 (b)	Explain about Thermistor and Sensistor bias compensation techniques.	6M	20EC302.4	L2
14 (a)	For the Common Source Amplifier, calculate the value of the voltage gain, given i) $r_d=100K\Omega$, $R_L=10K\Omega$, $g_m=300\mu$ and $R_O=9.09K\Omega$. ii) If $C_{DS}=3pF$, determine the output impedance at a signal frequency of 1 MHz.	7M	20EC302.5	L3

14 (b)	Discuss the analysis of small signal model of JFET.	5M	20EC302.5	L2
OR				
15 (a)	Give the comparison of BJT, JFET and MOSFET.	4M	20EC302.5	L1
15 (b)	Obtain the expression for voltage gain and current gain of a small signal low frequency Common Emitter amplifier.	8M	20EC302.5	L2

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022-2023

Degree	B. Tech. (U. G.)	Program	CSE	Academic Year	2022 - 2023
Course Code	20CS302	Test Duration	3 Hrs.	Max. Marks	70
Course	Design and Analysis of Algorithms				
				Semester	III

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define time complexity.	20CS302.1	L1
2	Write the basic principle of Divide and Conquer strategy	20CS302.2	L2
3	State the principle of optimality.	20CS302.3	L1
4	What is NP-Hard?	20CS302.4	L2
5	Define State space tree.	20CS302.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Explain Asymptotic Notations with examples and graphs.	12M	20CS302.1	L2
OR				
7 (a)	Discuss the steps in mathematical analysis for recursive algorithm. Do the same for finding the factorial of a number	8M	20CS302.1	L2
7 (b)	What is an algorithm? List the 3 characteristics of algorithm.	4M	20CS302.1	L1
8 (a)	Sort the records with the following index values in the ascending order using quick sort algorithm. 2, 3, 8, 5, 4, 7, 6, 9, 1.	6M	20CS302.4	L3
8 (b)	Write Merge Sort algorithm.	6M	20CS302.5	L2
OR				
9 (a)	Construct a maxHeap with 2, 3, 8, 5, 4, 7, 6, 9, 1.	8M	20CS302.4	L3
9 (b)	Write Strassen's Matrix Multiplication algorithm.	4M	20CS302.5	L2
10	State the Job - Sequencing with deadlines problem. Find an optimal sequence to the n = 5 Jobs where profits (P1, P2, P3, P4, P5) = (20, 15, 10, 5, 1) and deadlines (d1, d2, d3, d4, d5) = (2, 2, 1, 3, 3).	12M	20CS302.5	L3
OR				
11 (a)	Differentiate between greedy method and dynamic programming	4M	20CS302.3	L2
11 (b)	Describe the 0/1 Knapsack Problem. Find an optimal solution using dynamic programming 0/1 knapsack instance for n=3, m=6, profits are (p1, p2, p3) = (1, 2, 5), weights are (w1, w2, w3) = (2, 3, 4).	8M	20CS302.4	L3
12 (a)	Explain class of P, NP, NP complete problems	6M	20CS302.5	L2
12 (b)	Explain Cook's theorem	6M	20CS302.5	L2
OR				
13 (a)	Explain the non-deterministic sorting problem.	6M	20CS302.5	L2
13 (b)	Differentiate between NP-complete and NP-Hard.	6M	20CS302.5	L2
14	Construct complete state space tree for the subset sum problem for n = 5, d = 15, S = {1, 3, 5, 7, 11}	12M	20CS302.3	L3
OR				
15 (a)	Explain 8-queen's problem and apply back tracking to solve this problem	8M	20CS302.4	L3
15 (b)	Write the Graph - coloring problem. And draw the state space tree for m = 3 colors n = 4 vertices graph.	4M	20CS302.4	L3

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Semester End Regular/Supplementary Examination, Dec. /Jan., 2022 - 2023

Degree	B. Tech. (U. G.)	Program	CSE (DS)	Academic Year	2022 - 2023
Course Code	20DS302	Test Duration	3 Hrs. Max. Marks 70	Semester	III
Course	Foundations of Data Science				

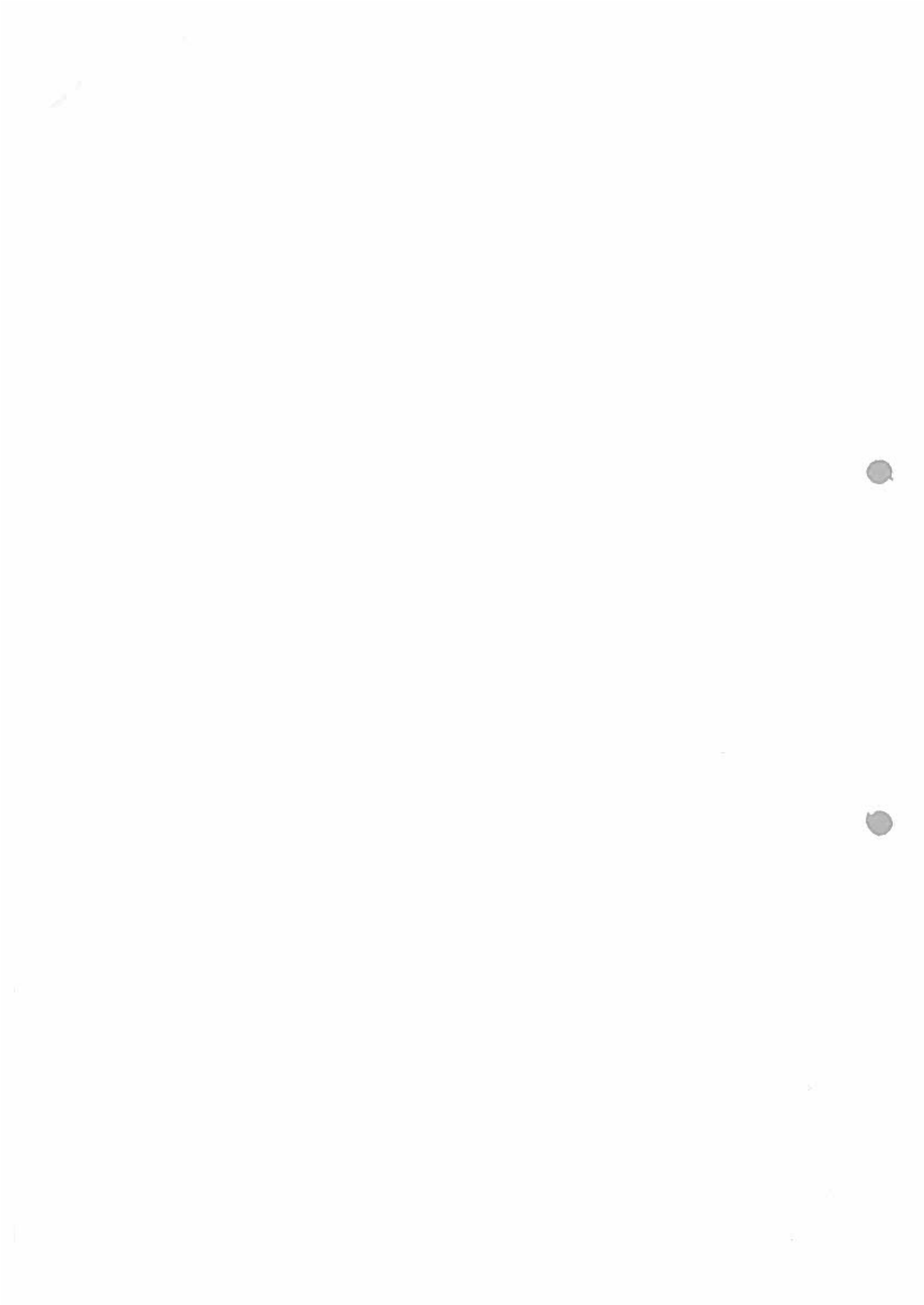
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Differentiate volume and variety	20DS302.1	L2
2	Define list in python	20DS302.2	L1
3	Distinguish supervised and unsupervised learning	20DS302.3	L2
4	What is data visualization dash board?	20DS302.4	L1
5	Where we use data wrangling	20DS302.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Compare data scientists and data engineers	6M	20DS302.1	L2
6 (b)	Explain Digging into MapReduce	6M	20DS302.1	L2
OR				
7 (a)	Compare the Types of data analytics	6M	20DS302.1	L2
7 (b)	Explain Taking Action on Business Insights	6M	20DS302.1	L2
8 (a)	Explain various types of loops and functions in python	6M	20DS302.2	L2
8 (b)	Explain R programming for data science	6M	20DS302.2	L2
OR				
9 (a)	Discuss about SQL in data science	6M	20DS302.2	L2
9 (b)	Explain using KNIME for advanced analytics	6M	20DS302.2	L2
10 (a)	Discuss about clustering with k-means algorithm	6M	20DS302.3	L2
10 (b)	Explain any two techniques for detecting outliers	6M	20DS302.3	L2
OR				
11 (a)	Explain lingo and spark streaming for IoT	6M	20DS302.3	L2
11 (b)	Differentiate Random forest and Decision tree methods	6M	20DS302.3	L2
12 (a)	Explain the designing meet the needs of your target audience	6M	20DS302.4	L2
12 (b)	Write about D3.js web applications	6M	20DS302.4	L2
OR				
13 (a)	Explain designing data visualizations for collaboration	6M	20DS302.4	L2
13 (b)	Analyze map projections and co ordinate systems	6M	20DS302.4	L2
14 (a)	How to Finding and telling your data story in journalism	6M	20DS302.5	L2
14 (b)	Explain modeling natural resources in Raw	6M	20DS302.5	L2
OR				
15 (a)	Explain Angling in on analytics in E-commerce	6M	20DS302.5	L2
15 (b)	Explain spatial crime prediction and monitoring	6M	20DS302.5	L2

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022/2023

Degree	B. Tech. (U. G.)	Program	CSE (AI & ML)			Academic Year	2022 - 2023
Course Code	20AI302	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Artificial Neural Networks						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What are the Learning Rules in Neural Network?	20AI302.1	L1
2	What is the difference between single layer and multilayer feedforward networks?	20AI302.2	L1
3	What is the function of Linear Least-Square Filters?	20AI302.3	L1
4	Where are the convolutional networks used?	20AI302.4	L1
5	How the Hetero Associative memory differ from Auto Associative memory?	20AI302.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Discuss about the building blocks of ANN.	12M	20AI302.1	L1
OR				
7	Discuss about the basic learning laws.	12M	20AI302.1	L1
8	What is McCulloch Pitts neuron model? Draw the diagrammatic representation of the model. Generate the output of OR and NOR function using the model.	12M	20AI302.2	L2
OR				
9	What is supervised and unsupervised learning? How the unsupervised learning works? List any 4 differences between supervised and unsupervised learning.	12M	20AI302.2	L2
10	Define learning rate. What is learning rate annealing? Discuss about the methods of learning rate annealing.	12M	20AI302.3	L2
OR				
11	What is Gaussian Bayes classifier? Discuss about the relation between the Perceptron and Bayes Classifier for a Gaussian Environment.	12M	20AI302.3	L2
12	What do you mean by XOR problem? Discuss about the Heuristics for Making the Back-Propagation Algorithm Perform Better.	12M	20AI302.4	L2
OR				
13 (a)	Discuss the back propagation and differentiation.	6M	20AI302.4	L2
13 (b)	Discuss the cross validation.	6M	20AI302.4	L2
14	What is content addressable memory? Draw the architecture of auto associative memory network. Write the steps of testing algorithm for auto associative memory.	12M	20AI302.5	L2
OR				
15	What do you mean by pattern association? What is the purpose of bi-directional associative memory? Draw the architecture and discuss the algorithm of BAM.	12M	20AI302.5	L2



Semester End Regular/Supplementary Examination, Dec./Jan., 2022 - 2023

Degree	B. Tech. (U. G.)	Program	Civil Engineering			Academic Year	2022- 2023
Course Code	20CE303	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	SURVEYING						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Mention some of the points which chainmen should know, concerning the errors in chaining.	20CE303.1	L1
2	What principles are used in surveying?	20CE303.2	L1
3	List the types of curves.	20CE303.3	L1
4	Define vector.	20CE303.4	L1
5	What are the distinguishing features of objects?	20CE303.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK															
6	<p>The fore and back bearings of a closed traverse conducted at a place are given below. Indicate which stations are affected by local attraction. Also find out the correct bearings.</p> <table border="1"> <thead> <tr> <th>Line</th> <th>Fore Bearing</th> <th>Back Bearing</th> </tr> </thead> <tbody> <tr> <td>AB</td> <td>S54°20'E</td> <td>N54°20'W</td> </tr> <tr> <td>BC</td> <td>N67°30'E</td> <td>S66°20'W</td> </tr> <tr> <td>CD</td> <td>N48°30'W</td> <td>S44°20'E</td> </tr> <tr> <td>DA</td> <td>S21°25'W</td> <td>N19°40'E</td> </tr> </tbody> </table>	Line	Fore Bearing	Back Bearing	AB	S54°20'E	N54°20'W	BC	N67°30'E	S66°20'W	CD	N48°30'W	S44°20'E	DA	S21°25'W	N19°40'E	12 M	20CE303.1	L3
Line	Fore Bearing	Back Bearing																	
AB	S54°20'E	N54°20'W																	
BC	N67°30'E	S66°20'W																	
CD	N48°30'W	S44°20'E																	
DA	S21°25'W	N19°40'E																	
OR																			
7 (a)	Explain how details can be surveyed by offsets from survey lines. Discuss the relative merits of different types of offsets	9M	20CE303.1	L2															
7 (b)	Distinguish between resection and intersection methods as applied to plane table surveying.	3M	20CE303.1	L1															
8	<p>The following series of readings of back sights and fore sights was taken in a fly leveling. The first reading was taken on a point of RL 100.000 m. Draw a page of leveling field book and enter readings on it. Find the reduced levels of all points using any method. Apply check. 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684. The instrument having moved after 3, 6 and 8th readings</p>	12M	20CE303.2	L3															
OR																			
9 (a)	What is meant by the least count of a vernier? Draw a vernier scale to read 78°40'20". The main scale is graduated in 20' parts and vernier scale in 20".	6M	20CE303.2	L3															
9 (b)	Explain how a subtense bar is used to determine horizontal angle.	6M	20CE303.2	L2															
10	Explain the components of simple circular curve with a neat sketch.	12M	20CE303.3	L2															
OR																			
11	It was required to obtain the elevation of the top of a tower located on the roof of a building. Since the direct measurement was not possible, the following data was obtained. A line AB, 120.0 m long was staked out and the horizontal angles to the	12M	20CE303.3	L3															

	tower were observed at A as 56° and at B as 32° . At point B a back sight of 2.000 m was taken on a BM of elevation 100.000m and the vertical angle to the top of tower was found to be 58° . Calculate the elevation of the top of tower.			
12	What are the three segments of GPS? Describe them.	12M	20CE303.4	L2
OR				
13 (a)	Determine the number of photographs required to cover 300 km^2 if the scale of photograph is 1 in 12000 and photograph format is $250 \text{ mm} \times 250 \text{ mm}$. The end overlap and side overlap are 60% and 30%.	6M	20CE303.4	L3
13 (b)	Explain the steps involved in creation of map projection.	6M	20CE303.4	L2
14 (a)	What is raster overlay operation? Explain.	6M	20CE303.5	L1
14(b)	What is supervised classification? What are the basic steps and stages involved in a typical supervised classification?	6M	20CE303.5	L1
OR				
15 (a)	What do you understand by spatial data and how are they integrated to make a GIS?	6M	20CE303.5	L2
15 (b)	Discuss overlay using a decision table.	6M	20CE303.5	L1

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 – 2023

Degree	B. Tech. (U. G.)	Program	Mechanical Engineering			Academic Year	2022 - 2023
Course Code	20ME303	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Material Science & Metallurgy						

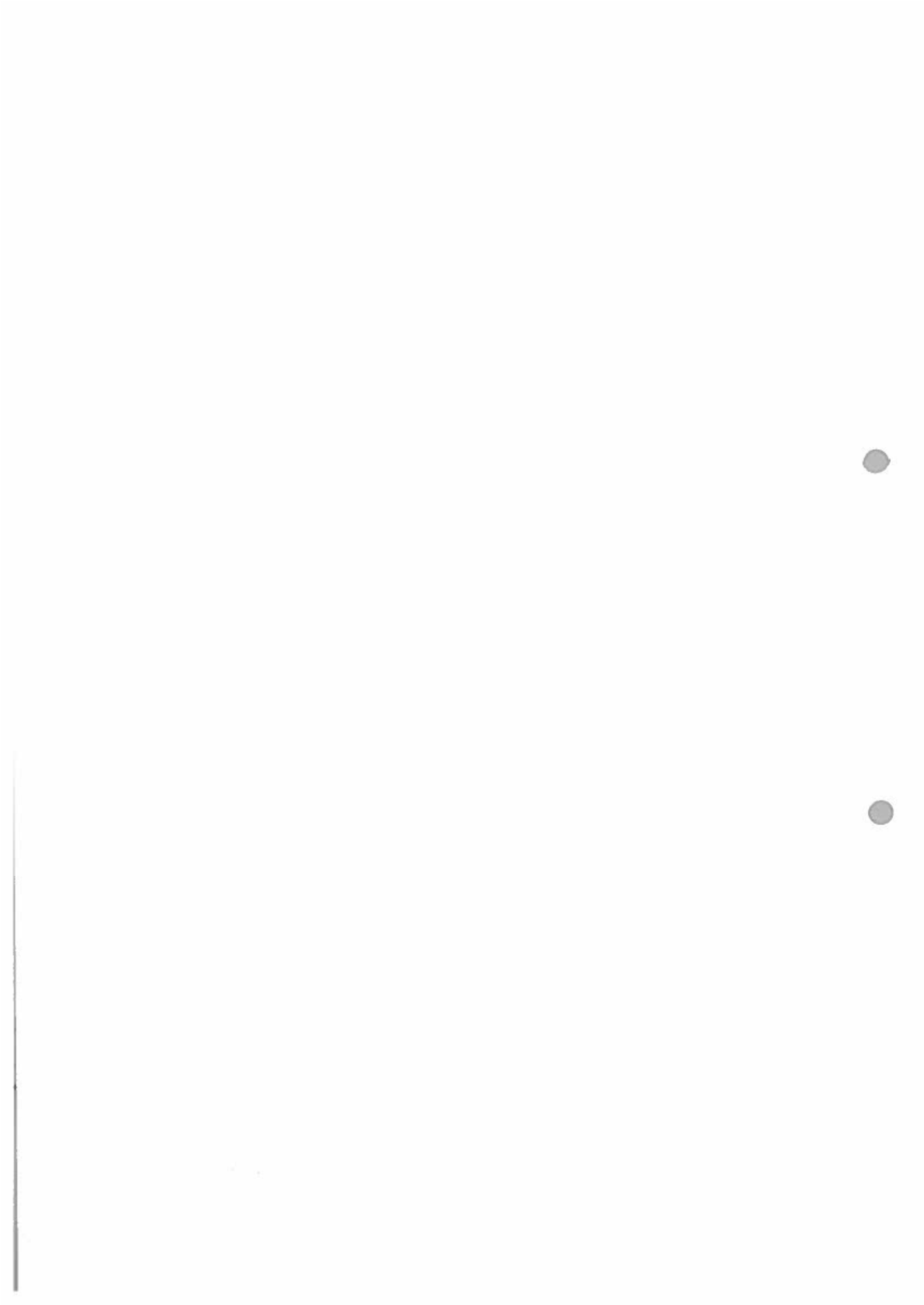
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write the important characteristics of metals and alloys?	20ME302.1	L1
2	List any two applications of steel.	20ME302.2	L1
3	What is meant by normalizing?	20ME302.3	L1
4	What are the functions of compaction of metal powders?	20ME302.4	L1
5	List any two examples of cermets	20ME302.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Classify in detail the different types of crystal imperfections. Explain the edge dislocation with a neat sketch.	6M	20ME302.1	L2
6 (b)	Discuss selection criteria for materials used in engineering applications.	6M	20ME302.1	L2
OR				
7	Explain Fe ₃ - Fe ₃ C phase diagram with various reactions in it.	12M	20ME302.1	L2
8 (a)	Differentiate between grey cast iron and white cast iron with respect to properties and applications.	6M	20ME302.2	L2
8 (b)	Explain the structure and properties of plain carbon steels.	6M	20ME302.2	L2
OR				
9 (a)	Write in detail about the properties and applications of copper and its alloys?	6M	20ME302.2	L2
9 (b)	Explain the properties and applications of phosphor bronze and aluminium bronze.	6M	20ME302.2	L2
10 (a)	Write full name of TTT diagram and explain how it is constructed.	6M	20ME302.3	L2
10 (b)	Distinguish between Normalizing and Annealing.	6M	20ME302.3	L2
OR				
11 (a)	Explain the processes of Nitriding. When do you use it?	6M	20ME302.3	L2
11 (b)	Explain in detail about different types of carburizing methods?	6M	20ME302.3	L2
12 (a)	Explain the following processes (i) Infiltration (ii) Impregnation	6M	20ME302.4	L2
12 (b)	What is sintering in powder metallurgy? Explain.	6M	20ME302.4	L2
OR				
13	Explain the important steps involved in the production of components by powder metallurgy technique.	12M	20ME302.4	L2
14 (a)	Sketch and explain different methods of processing ceramics.	6M	20ME302.5	L2
14 (b)	List the various types of glasses, enumerate its properties and applications.	6M	20ME302.5	L2
OR				
15 (a)	Explain the term composite material with examples. State their advantages and limitations of composites in practice.	6M	20ME302.5	L2
15 (b)	Explain the typical material properties of nanomaterials.	6M	20ME302.5	L2

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 – 2023

Degree	B. Tech. (U. G.)	Program	EEE	Academic Year	2022 - 2023
Course Code	20EE303	Test Duration	3 Hrs. Max. Marks 70	Semester	III
Course	ELECTRICAL CIRCUIT ANALYSIS				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Compare any four features of AC and DC circuit.	20EE303.1	L2
2	State the relation between voltage and current in delta connected system	20EE303.2	L1
3	List any two advantages of Thevenins theorem.	20EE303.3	L1
4	Identify the symmetry and reciprocity of h parameters in two port networks.	20EE303.4	L1
5	Express the time constant for series RL and RC circuits.	20EE303.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Find the value of V_a for the following circuit using KVL in figure .1	12M	20EE303.1	L3

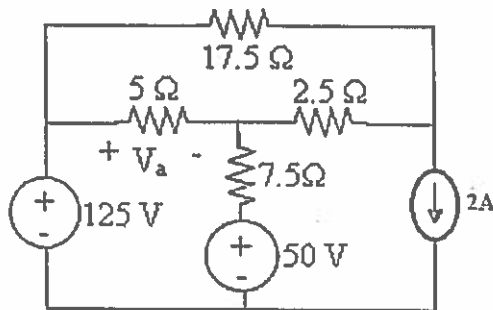


Figure.1

OR

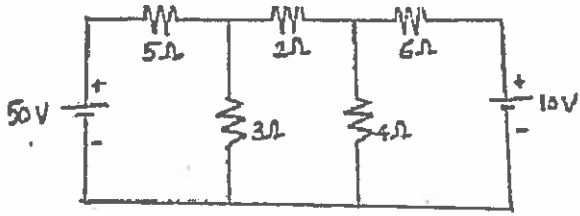
7 (a)	Distinguish between series and parallel circuit. Determine the power dissipation in the 4Ω resistor of the given circuit shown in figure.2 by using nodal analysis.	4M	20EE303.1	L2
7 (b)		8M	20EE303.1	L3

Figure.2

8 (a)	The impedances of parallel circuit are $Z_1 = (6+j8)$ ohms and $Z_2 = (8-j6)$ ohms. If the applied voltage is 120V, find (i) current and power factor of each branch (ii) overall current (iii) power consumed by each impedance. Draw the phasor diagram.	8M	20EE303.2	L3
8 (b)	Define power factor, apparent power, active power and reactive power.	4M	20EE303.2	L2
OR				
9 (a)	A balanced star connected load of $(4+j3)\Omega$ per phase is connected to a balanced 3ϕ 400V supply. Find a) active power b) reactive power c) Apparent power.	5M	20EE303.2	L3
9 (b)	Explain two wattmeter method with a neat sketch.	7M	20EE303.2	L2

Find the voltage across 4Ω resistance using superposition theorem

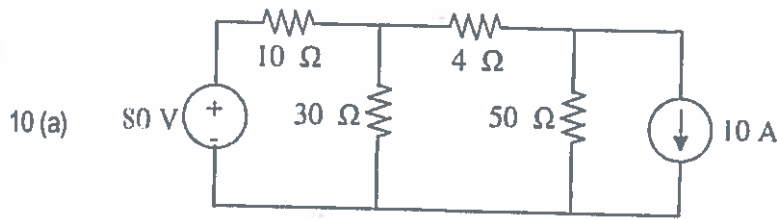


Figure.3

10 (b) State and explain Norton's theorem.

4M

20EE303.3

L2

OR

Find Thevenin's equivalent for the circuit shown in figure 4.

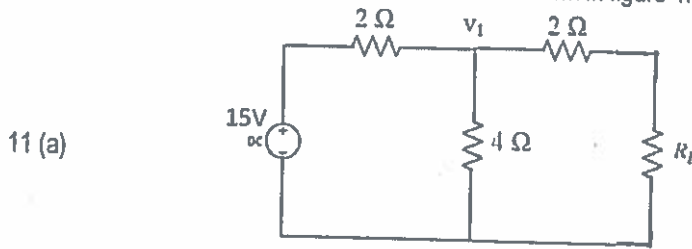


Figure.4

11 (a)

8M

20EE303.3

L3

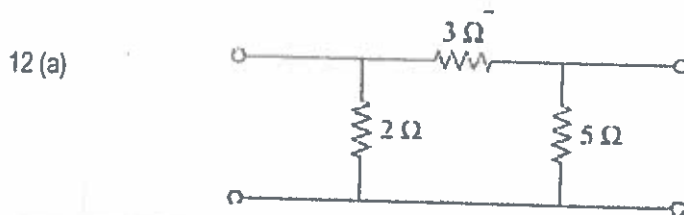
11 (b) Define maximum power transfer theorem and explain its importance.

4M

20EE303.3

L2

Find the Z- parameters for the following circuit.



12 (a)

6M

20EE303.4

L3

12 (b) Express h parameters in terms of ABCD parameters.

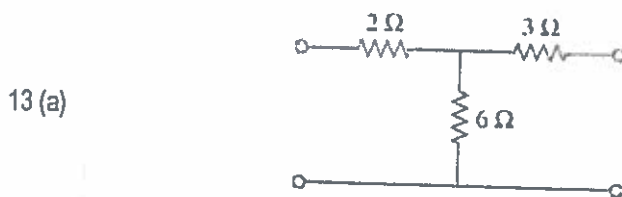
6M

20EE303.4

L2

OR

Find the Y- parameters for the following circuit.



13 (a)

8M

20EE303.4

L3

13 (b) Derive the relation between Z and Y parameters.

4M

20EE303.4

L2

14 Derive the expression of voltage across R and L for RL series circuit.

12M

20EE303.5

L3

OR

15 In Series RL Circuit with $R=100$ Ohms and $L=20$ Henry has a DC Voltage of 200 Volts applied through a switch at $t=0$. Find (i) Current and Voltage across each element (ii) Current at time $t=0.5$ Seconds (iii) Current at time $t=1$ Second (iv) Time at which $E_R=E_L$.

12M

20EE303.5

L3

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 - 2023

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20EC303	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Signals and Systems						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define signal and mention its mathematical equation of Unit step signal	20EC303.1	L1
2	What is the Fourier transform of the impulse function $\delta(t)$	20EC303.2	L1
3	Differentiate convolution and correlation	20EC303.3	L1
4	Draw the ideal filter characteristics of a Low pass filter	20EC303.4	L1
5	Find the Z-transform of the sequence $a^n U[n]$	20EC303.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Classify the systems with an example	6M	20EC303.1	L1
6 (b)	Give the mathematical equation and plot the waveform for the following functions a) $\delta(t)$ b) $U(n)$ c) Analog Sinusoidal Signal	6M	20EC303.1	L2
OR				
7	Check whether the following system is static or Dynamic, Linear or non Linear, Causal or Non causal, Time Variant or invariant i) $y(t) = 10x(t) + 5$ ii) $y(n) = x(n) + x(n-1)$ iii) $y(t) = x(2t)$	12M	20EC303.1	L2
8(a)	Develop the expression for mean square error using the expression of a function using orthogonal signal space	6M	20EC303.2	L3
8 (b)	Find the Fourier transform of a Full wave rectified output whose fundamental period is 2π	6M	20EC303.2	L1
OR				
9	Prove the following properties of Fourier Transform 1) Linearity 3) Time Reversal 5) Frequency Shifting 2) Time shifting 4) Differentiation in Time Domain 6) Scaling	12M	20EC303.2	L2
10 (a)	Perform the convolution of the two sequences $x[n] = \{-2, 2, -2, 2\}$ and $h[n] = \{1, -1, 1, -1\}$	6M	20EC303.3	L3
10 (b)	Explain cross correlation function, write any 4 properties and prove any two of them.	6M	20EC303.3	L4
OR				
11 (a)	State and prove Parseval's theorem for energy / power signals	6M	20EC303.3	L2
11 (b)	Perform the convolution of $h(t) = e^{-2t}u(t)$ and $x(t) = e^{-3t}u(t)$	6M	20EC303.3	L2
12	Derive the Relationship between Bandwidth and Rise time	12M	20EC303.4	L2
OR				
13	Enumerate the difference between Impulse sampling, Flat Top Sampling and Natural Sampling	12M	20EC303.4	L2
14	Obtain the Z-transform of $x(n) = a^n U(n) - b^n U(-n-1)$ indicate the ROC	12M	20EC303.5	L3
OR				
15	Obtain the Laplace transform of the following signals i) Impulse function ii) unit step function iii) $A \sin \omega_0 t u(t)$	12M	20EC303.5	L3

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022/2023

Degree	B. Tech. (U. G.)	Program	CSE, CSE (AI & ML) & CSE (DS)			Academic Year	2022 – 2023
Course Code	20CS303	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Database Management System						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is a Table? Give example.	20CS303.1	L1
2	What is a constraint?	20CS303.2	L1
3	List out all commands in DDL.	20CS303.3	L1
4	What is Redundancy? List-out any two problems caused by redundancy.	20CS303.4	L1
5	Define i) Lock and ii) Locking protocol.	20CS303.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	What is E-R Model? List and Explain the symbols used in E-R Diagrams with examples.	12M	20CS303.1	L2
OR				
7	What is Data Abstraction? Illustrate and explain briefly about the 3-levels of Data abstraction.	12M	20CS303.1	L2
8	What is a Join? Explain i) Equi Join ii) Natural Join iii) Outer Join (left, right, full) with examples, in connection to SQL.	12M	20CS303.2	L2
OR				
9	What is Relational Calculus? Explain i) Tuple Relational Calculus ii) Domain Relational Calculus with examples.	12M	20CS303.2	L2
10	Explain Nested queries and Aggregate functions with example	12M	20CS303.3	L2
OR				
11 (a)	Apply database trigger for insertion and updating a records.	6M	20CS303.3	L3
11 (b)	What are null values? How DBMS deals with null values?	6M	20CS303.3	L2
12	What is BCNF? Explain BCNF with an example.	12M	20CS303.4	L2
OR				
13	What is ISAM? Illustrate ISAM with an example.	12M	20CS303.4	L2
14	Explain Lock-based Concurrency Control.	12M	20CS303.5	L2
OR				
15	Apply ARIES algorithm for system crash recovery.	12M	20CS303.5	L3

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022-2023

Degree	B. Tech. (U.G.)	Program	Civil Engineering			Academic Year	2022 - 2023
Course Code	20CE304	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Strength of Materials						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write any 4 uses of Mohr's circle.	20CE304.1	L1
2	Define the terms (i) Bending stress (ii) Shear stress	20CE304.2	L1
3	Calculate the maximum deflection of a simply supported beam carrying a point load of 100 kN at mid span. Span = 6 m, $E = 20000 \text{ kN/m}^2$. For rectangular cross section of the beam is 200x300 mm	20CE304.3	L2
4	Define (i) Slenderness ratio (ii) Radius of Gyration.	20CE304.4	L1
5	Distinguish between thick and thin cylinders.	20CE304.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain clearly the different types of stresses and strains.	6M	20CE304.1	L2
6 (b)	Explain in detail the behavior of mild-steel when subjected to tensile load with aid of stress strain diagram.	6M	20CE304.1	L2

OR

7	A steel rod of 20mm diameter passes centrally through a copper tube of 50mm external diameter and 40mm internal diameter. The tube is closed at each end by rigid plates of negligible thickness. The nuts are tightened lightly home on the projecting parts of the rod. If the temperature of the assembly is raised by 50°C, calculate the stress developed in copper and steel. Take E for steel and copper as 200 GN/m ² and 100 GN/m ² and α for steel and copper as 12×10^{-6} per °C and 18×10^{-6} per °C. Assume any necessary data	12M	20CE304.1	L3
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8	Derive the shear stress distribution for the following sections when it is subjected to shear force F a. Rectangular section, $b \times d$ b. Circular section, d diameter	12M	20CE304.2	L3
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OR

9	Derive the bending equation with usual notations.	12M	20CE304.2	L2
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10	A 3 m long cantilever of uniform rectangular cross-section 150 mm wide and 300 mm deep is loaded with a point load of 3 kN at the free end and a UDL of 2 kN/m over the entire length. Find the slope maximum deflection at the free end. $E = 210 \text{ kN/mm}^2$. Use Macaulay's method. Assume any necessary data.	12M	20CE304.3	L2
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OR

11	A simply supported beam of span 6 m is subjected to a udl of 2 kN/m over the entire span. Find the slope at support and maximum deflection at the mid section by method moment area method. EI is constant. Assume any necessary data.	12M	20CE304.3	L2
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12 (a)	A simply supported beam of length 4 m is subjected to uniformly distributed load of 30 kN/m over the whole span and deflects 15 mm at the centre. Determine the crippling loads when the beam is used as column when one end fixed and other end hinged .	6M	20CE304.4	L3
12 (b)	Derive an expression for crippling load when both ends of the columns are hinged.	6M	20CE304.4	L3
OR				
13	A hollow cylindrical cast iron column is 4 m long with both ends fixed. Determine the minimum diameter of the column if it has to carry a safe load of 250 kN with a factor of safety. Take the internal diameter as 0.8 times the external diameter. Take $\sigma_c = 550 \text{ N/mm}^2$ and $\alpha = \frac{1}{1600}$ in Rankine's formula.	12M	20CE304.4	L3
14	Determine the diameter of a solid shaft which will transmit 300 KN at 250 rpm. The maximum shear stress should not exceed 30 N/mm ² and twist should not be more than 10 in a shaft length 2 m. Take modulus of rigidity = $1 \times 10^5 \text{ N/mm}^2$.	12M	20CE304.5	L3
OR				
15 (a)	Derive an expression for thin cylinder subjected to internal fluid pressure P. determine the longitudinal stress and hoop stress.	6M	20CE304.5	L2
15 (b)	Explain various types of springs.	6M	20CE304.5	L2

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022 – 2023

Degree	B. Tech. (U.G.)	Program	Mechanical Engineering	Academic Year	2022 - 2023
Course Code	20ME304	Test Duration	3 Hrs. Max. Marks 70	Semester	III
Course	Mechanics of Solids				


Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define factor of safety.	20ME304.1	L1
2	Give the relation between S.F, B.M and rate of loading at a section of a beam.	20ME304.2	L1
3	State the formula section modulus for hollow rectangular section.	20ME304.3	L1
4	Why hollow circular shaft are preferred when compared to solid circular shaft?	20ME304.4	L1
5	Differentiate between thin cylinder and thick cylinder.	20ME304.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw a neat sketch of stress- strain curve diagram of stainless steel and explain.	8M	20ME304.1	L2
6 (b)	The Young's modulus of a material is 210 kN/mm ² and modulus of rigidity 75 kN/mm ² . Determine the bulk modulus.	4M	20ME304.1	L2
OR				
7	Derive relations for normal and shear stresses acting on an inclined plane at a point in a strained material subjected to mutually perpendicular direct stresses.	12M	20ME304.1	L3
8	A cantilever beam 6 m long carries load of 30 kN, 70 kN, 40 kN and 60 kN at a distance of 1 m, 2 m, 3 m, 6 m respectively from the fixed end. Draw shear force and bending moment diagram.	12M	20ME304.2	L2
OR				
9 (a)	A cantilever beam of length 4 m carries point loads of 1 kN, 2 kN and 3 kN at a 1, 2 and 4 m from the fixed end. Draw S.F.D and B.M.D	6M	20ME304.2	L2
9 (b)	A simply supported beam of length 8 m carries a point load of 6kN and 4 kN at a distance of 2 m and 4 m from the left end. Draw S.F.D and B.M.D	6M	20ME304.2	L2
10	State the assumptions and derive bending moment equation.	12M	20ME304.3	L2
OR				
11	An I section with rectangular ends has the following dimensions: Flanges = 150 mm x 25 mm, Web = 300 mm x 10 mm, Total depth = 350 mm. Determine the maximum shearing stress developed in the beam for the shearing force of 25 kN.	12M	20ME304.3	L3
12	A steel cantilever 6m long carries two point loads 20 kN at the free end and 25 kN at a distance of 2 m from the free end. Find the slope and deflection at free end. Take $I = 1.3 \times 10^9 \text{ mm}^4$ and $E = 2 \times 10^5 \text{ N/mm}^2$.	12M	20ME304.4	L3
OR				
13 (a)	Design a suitable diameter for a circular shaft required to transmit 80.2 kW at 200 rpm. The shear stress in the shaft is not to exceed 75 MN/m ² and the maximum torque exceeds the mean by 40%. Also calculate the angle of twist in a length of 2 metres. Take $C = 84 \text{ GN/m}^2$.	4M	20ME304.4	L3
13 (b)	Derive Torsional equation.	8M	20ME304.4	L3

14	<p>A hollow cylindrical drum 750 mm in diameter and 2.6 m long has a shell thickness of 12 mm. If the drum is subjected to an internal pressure of 2.7 N/mm². Determine</p> <p>a. Change in diameter b. Change in length and c. Change in volume</p> <p>Take $E = 2.1 \times 10^5$ N/mm² and Poisson's ratio = 0.3.</p>	12M	20ME304.5	L3
OR				
15	<p>Determine the ratio of strength of a solid steel column to that of a hollow column of internal diameter equal to $\frac{3}{4}$ of its external diameter. Both the columns have the same cross-sectional areas, length and end conditions.</p>	12M	20ME304.5	L3


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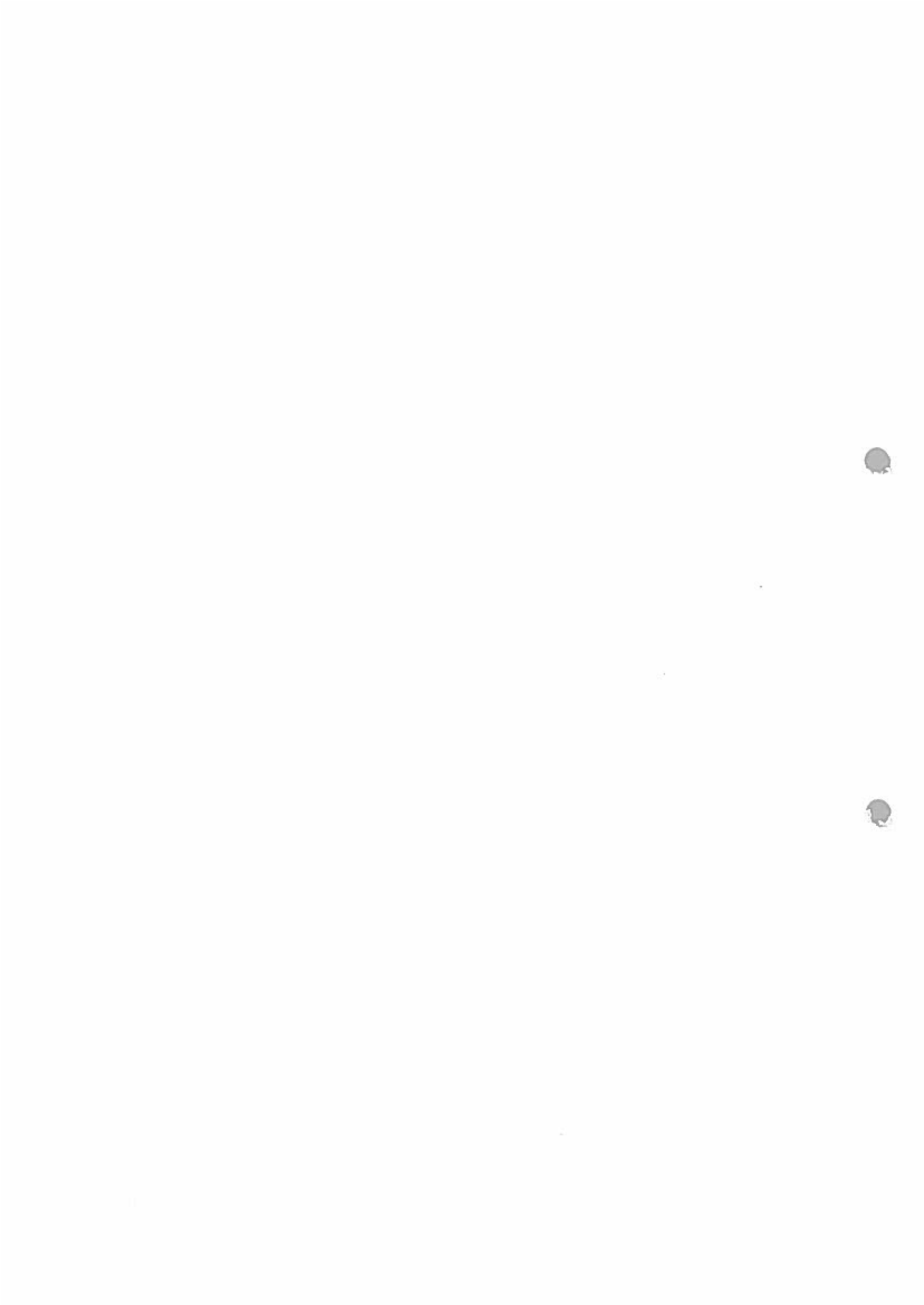
Degree	B. Tech. (U. G.)	Program	EEE	Academic Year	2022 - 2023
Course Code	20EE304	Test Duration	3 Hrs. Max. Marks	70	Semester III
Course	DC Machines & Transformers				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Distinguish between singly excited and doubly excited systems.	20EE304.1	L2
2	List any two losses occurs in DC generators.	20EE304.2	L1
3	Write the condition to get maximum efficiency in DC machine.	20EE304.3	L1
4	Define the term transformation ratio in transformers.	20EE304.4	L1
5	Mention the reason of OC test performed on LV side of a single phase transformer.	20EE304.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Derive an expression for magnetic force developed in a doubly-excited translational magnetic system.	12M	20EE304.1	L2
OR				
7 (a)	Derive expressions of field energy, co energy and magnetic force in a singly excited electromechanical unit.	6M	20EE304.1	L2
7 (b)	Explain the concept of energy in magnetic system with neat diagram.	6M	20EE304.1	L2
8 (a)	Explain the construction and working principle of DC generator with neat diagram	6M	20EE304.2	L2
8 (b)	A 4 pole lap wound DC shunt generator has a useful flux/pole of 0.07 Wb. The armature winding consists of 220 turns, each of 0.04 Ω resistance. Calculate the terminal voltage when running at 900 rpm, if armature current is 50 A.	6M	20EE304.1	L3
OR				
9 (a)	Derive an expression for EMF equation of DC Generator.	6M	20EE304.2	L2
9 (b)	Explain the internal and external characteristics of DC shunt generator.	6M	20EE304.2	L2
10 (a)	Derive equation for armature torque of a dc motor. Also mention the importance of back EMF.	12M	20EE304.3	L2
OR				
11 (a)	Explain the working principle of DC motor with neat diagram	6M	20EE304.3	L2
11 (b)	Compare the armature and field control method of speed control of dc motor.	6M	20EE304.3	L2
12 (a)	Explain the working principle of transformer with neat diagram.	6M	20EE304.4	L2
12 (b)	A 400/230 V, 50 Hz, single phase transformer has 200 turns on high voltage side. Find turns ratio, transformation ratio, and number of turns on low voltage winding. Also find the flux developed in the core.	6M	20EE304.4	L3
OR				
13	Draw the phasor diagram of an ideal transformer on no load. Also, draw a phasor diagram of a practical transformer supplying lagging power factor load.	12M	20EE304.4	L3
14	Explain the features of OC and SC test of transformer with necessary diagrams. Also mention the advantages of these tests.	12M	20EE304.5	L2
OR				
15 (a)	Discuss the necessity of parallel operation of transformers. Also state the conditions for satisfactory operation of three phase transformer in parallel.	6M	20EE304.5	L2
15 (b)	Explain the important features of auto transformer.	6M	20EE304.5	L2



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Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20EC304	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Random Variables and Stochastic Processes						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Two dice are thrown. What is the probability that the sum on the dice is twelve?	20EC304.1	L1
2	Write Chebyshev's inequality.	20EC304.2	L1
3	Find the mean value of a uniform random variable.	20EC304.3	L2
4	Write $E[X^2(t)]$ in terms of the PSD of $X(t)$.	20EC304.4	L1
5	Write the expression for average noise figure of cascaded networks.	20EC304.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK												
6 (a)	Discuss the significance of a Gaussian random variable using its probability density and distribution functions.	6M	20EC304.1	L2												
6 (b)	State and prove Bayes theorem.	6M	20EC304.1	L2												
OR																
7 (a)	Explain the distribution and density functions of Rayleigh random variable with neat sketches.	6M	20EC304.1	L2												
7 (b)	Define conditional probability distribution function and write the properties.	6M	20EC304.1	L1												
8 (a)	State and prove the properties of variance of a random variable.	6M	20EC304.2	L3												
8 (b)	Find the variance of a uniform random variable distributed over the interval $[a, b]$.	6M	20EC304.2	L3												
OR																
9 (a)	A random variable X is uniformly distributed on the interval $(-5, 15)$. Another random variable $Y=e^{X^2}$ is formed. Find $E[Y]$.	6M	20EC304.2	L3												
9 (b)	If X discrete is a random variable with probability mass function given as below table <table border="1" style="margin: 10px auto;"> <tr> <td>X</td> <td>-4</td> <td>-2</td> <td>0</td> <td>2</td> <td>4</td> </tr> <tr> <td>P(X)</td> <td>1/5</td> <td>2/5</td> <td>1/10</td> <td>1/15</td> <td>1/5</td> </tr> </table> Solve i) $E[X]$ ii) $E[X^2]$ iii) $E[2X+3]$ iv) $E[(2X+1)^2]$	X	-4	-2	0	2	4	P(X)	1/5	2/5	1/10	1/15	1/5	6M	20EC304.2	L2
X	-4	-2	0	2	4											
P(X)	1/5	2/5	1/10	1/15	1/5											
10 (a)	If X and Y are independent, show that $E[XY]=E[X]E[Y]$.	6M	20EC304.3	L3												
10 (b)	State and prove central limit theorem for equal distributions case.	6M	20EC304.3	L3												
OR																
11 (a)	X and Y are two independent random variables related to W as $W= X+Y$. Find $f_w(w)$ in terms of $f_x(x)$ and $f_y(y)$.	6M	20EC304.3	L3												
11 (b)	If X and Y are two independent random variables, then $\phi_{X+Y}(\omega) = \phi_X(\omega)\phi_Y(\omega)$	6M	20EC304.3	L3												

12 (a)	Explain about Poisson random processes.	6M	20EC304.4	L2
12 (b)	State any four properties of power spectral density and cross power spectral density.	6M	20EC304.4	L1
OR				
13 (a)	A random process had the power density spectrum $S_{xx}(w)=6w^2/1+w^2$, find the average power in the process.	6M	20EC304.4	L2
13 (b)	State and prove the relationship between Power Density Spectrum and auto correlation function.	6M	20EC304.4	L3
14 (a)	Write all the properties of narrow band noise.	6M	20EC305.5	L1
14 (b)	Define convolution. List any four properties of convolution.	6M	20EC304.5	L1
OR				
15 (a)	Explain the following i) Noise Figure ii) Noise Sources	6M	20EC304.5	L2
15 (b)	Explain the thermal noise.	6M	20EC304.5	L2

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Degree	B. Tech. (U. G.)	Program	CSE, CSE (AI & ML) & CSE (DS)	Academic Year	2022 - 2023
Course Code	20CS304	Test Duration	3 Hrs.	Max. Marks	70
Course	Object Oriented Programming through C++				
				Semester	III

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is the use of Scope resolution operator?	20CS304.1	L1
2	Define Inline function.	20CS304.2	L2
3	Develop the class X includes a routine to overload the – operator, Write a statement that subtracts an object of class X, x1 from another such object x2 and places the result in x3.	20CS304.3	L3
4	List out the two types of exceptions provided by C++.	20CS304.4	L1
5	Define iterators.	20CS304.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the principles of object oriented programming with illustrative examples.	6M	20CS304.1	L2
6 (b)	Develop a C++ program to explain default arguments with an example.	6M	20CS304.1	L2

OR

7 (a)	Build a C++ program to find the volume of shapes using function overloading.	6M	20CS304.1	L3
7 (b)	Construct a program in C++ to convert the binary number to octal. Eg: (000100) ₂ - (04) ₈ .	6M	20CS304.1	L3
8 (a)	Define a class to represent employee database and calculate the net salary.	6M	20CS304.2	L2
8 (b)	Explain friend functions with an example.	6M	20CS304.2	L2

OR

9 (a)	Define a class called complex. Include function for reading and displaying complex objects. Write a function to overload +operator to add two complex objects.	6M	20CS304.2	L1
9 (b)	Construct a C++ program to convert Fahrenheit object to Celsius object.	6M	20CS304.2	L2
10 (a)	Demonstrate the C++ program to generate a Fibonacci series.	6M	20CS304.3	L2
10 (b)	Construct a C++ program to add two distance objects by overloading the addition operator.	6M	20CS304.3	L3

OR

11 (a)	Develop a C++ program to implement single inheritance with parent class is teacher and inherit the teacher's name into the child class student.	6M	20CS304.3	L3
11 (b)	Explain about the multiple inheritance with an example.	6M	20CS304.3	L2
12 (a)	Explain the virtual function with an example.	6M	20CS304.4	L2
12 (b)	Compare static binding and dynamic binding. Explain it with neat example code.	6M	20CS304.4	L2

OR

13 (a)	Define an exception "Division by Zero" that is thrown when any number is divided by zero. Write a program that uses this exception.	6M	20CS304.4	L2
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13 (b)	What is standard template library? Explain vector class implementation with an example.	6M	20CS304.5	L2
14	Illustrate a function template to sort arrays of float and int using bubble sort.	12M	20CS304.5	L2
OR				
15	Extend a class template to generate a class matrix automatically for a matrix of any particular type Using the class template definition, the program should handle the arithmetic operations (+, -, *, /) For any particular type. (Such as int, float, double, char).	12M	20CS304.5	L2

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Degree	B. Tech. (U. G.)	Program	Civil Engineering	Academic Year	2022 - 2023
Course Code	20CE305	Test Duration	3 Hrs. Max. Marks 70	Semester	III
Course	Fluid Mechanics				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define vapour pressure and surface tension of a fluid.	20CE305.1	L1
2	List any two applications of flownet.	20CE305.2	L1
3	State Hagen-Poiseuille Law.	20CE305.3	L1
4	Define draft tube.	20CE305.4	L1
5	What is boundary layer?	20CE305.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Explain the difference between Piezometer and U-Tube Manometer with derivations and diagrams.	12M	20CE305.1	2
OR				
7 (a)	A block of material of specific gravity 0.45 floats in water. Determine the meta-centric height of the block if its size is 3 m * 2 m * 0.8 m.	6M	20CE305.1	L3
7 (b)	A Rectangular plane surface 1 m wide and 3 m deep lies in water in such a way that its plane surface makes an angle of 30° with the free surface of water. Determine the total pressure and the depth of centre of pressure when upper edge of the plate is 2 m below the free surface.	6M	20CE305.1	L3
8 (a)	Explain various types of fluid flows.	4M	20CE305.2	L2
8 (b)	The velocity potential function is given by $\phi = y^2 - x^2 - xy^3/2 + x^3y/2$. Find the velocity components in x and y directions. Show that ϕ represents a possible case of flow.	8M	20CE305.2	L3
OR				
9	Derive Bernoulli's equation for a compressible frictionless fluid.	12M	20CE305.2	L2
10	Derive Darcy Weisbach equation for head loss in case of pipe flow.	12M	20CE305.3	L2
OR				
11	Describe Reynolds experiment for characterization of flows in pipe.	12M	20CE305.3	L2
12	Draw inlet and outlet triangles of Pelton turbine and explain the working of the turbine with neat sketches.	12M	20CE305.4	L2
OR				
13 (a)	What are unit quantities? Define unit quantities for a turbine. Why they are important?	6M	20CE305.4	L1
13 (b)	Explain the factors which influence the selection of turbine.	6M	20CE305.4	L2
14	How will you find the drag on a flat plate due to laminar and turbulent boundary layers?	12M	20CE404.5	L3
OR				
15	Derive the expression for displacement thickness and discuss the characteristics of laminar and turbulent boundary layer.	12M	20CE404.5	L2

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022-2023

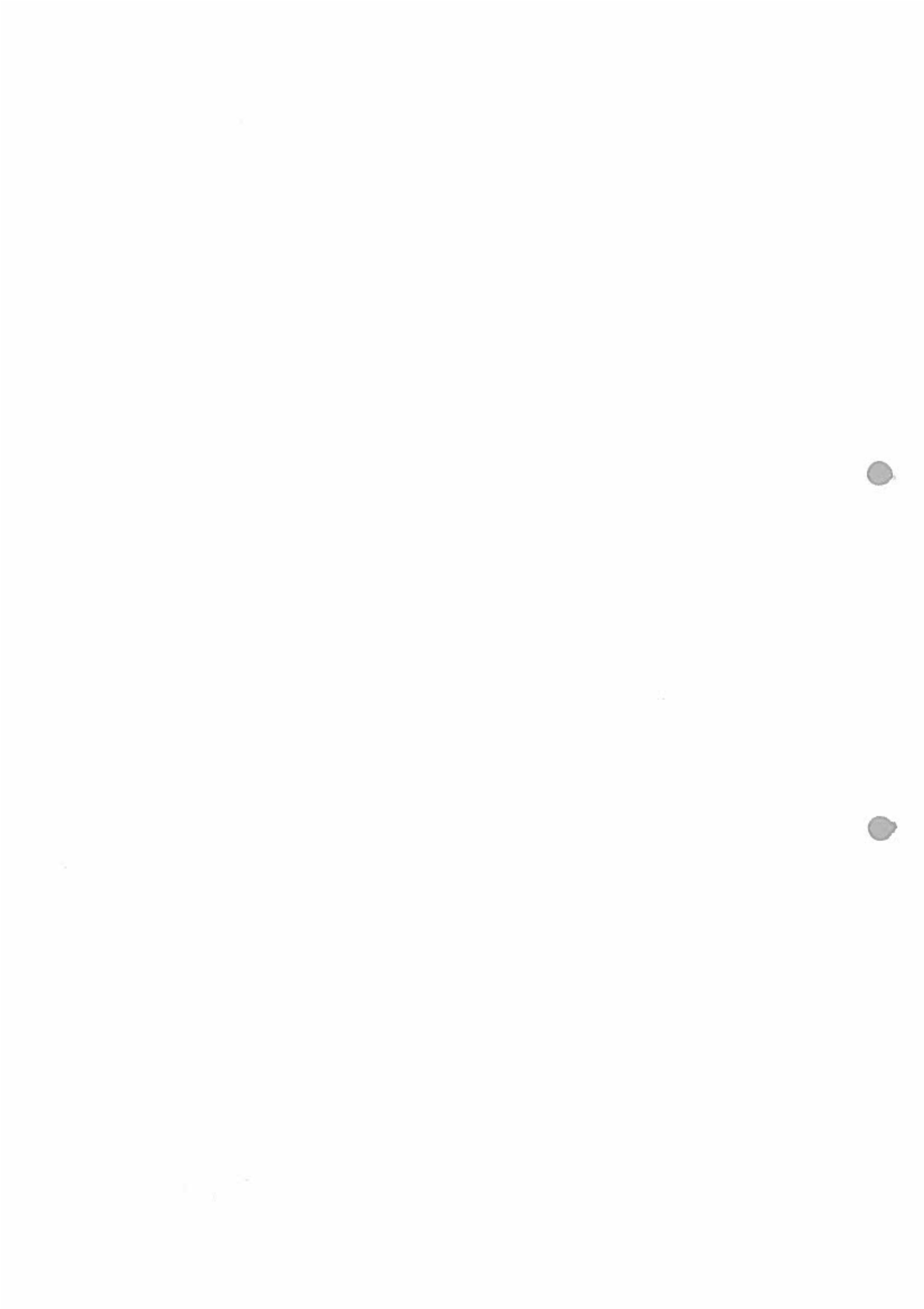
Degree	B. Tech. (U. G.)	Program	Mechanical Engineering	Academic Year	2022 - 2023
Course Code	20ME305	Test Duration	3 Hrs. Max. Marks 70	Semester	III
Course	Manufacturing Process				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four properties required for a moulding sand.	20ME305.1	L1
2	What are the functions of risers?	20ME305.2	L1
3	State the principle of liquid penetrant testing of welds.	20ME305.3	L1
4	List any four forging defects.	20ME305.4	L1
5	Recall spring back and its remedies.	20ME305.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are the advantages and disadvantages of different pattern materials?	6M	20ME305.1	L1
6 (b)	List out the steps involved in making a casting. Explain with the help of neat sketches.	6M	20ME305.1	L2
OR				
7 (a)	Why is it desirable to make the pattern allowances as small as possible?	6M	20ME305.1	L1
7 (b)	Explain the different types of gating systems. Mention advantages and demerits of each.	6M	20ME305.1	L2
8 (a)	Make a list of safety considerations and precautions that should be taken concerning all aspects of melting and casting of metals, including equipment involved.	6M	20ME305.2	L1
8 (b)	Sketch and explain the construction and operation of hot chamber die casting process.	6M	20ME305.2	L2
OR				
9 (a)	Is there any difference in the tendency for shrinkage void formation for metals with short and long freezing ranges, respectively? Explain.	6M	20ME305.2	L2
9 (b)	Explain the different zones in cupola.	6M	20ME305.2	L2
10 (a)	Describe the difference between brazing and soldering.	6M	20ME305.3	L2
10 (b)	What are the parameters that control the weld quality in manual metal-arc welding?	6M	20ME305.3	L1
OR				
11 (a)	Explain the difference between TIG welding and MIG welding.	6M	20ME305.3	L2
11 (b)	Describe with the help of a neat sketch the principle of spot welding.	6M	20ME305.3	L2
12 (a)	Explain the features of different types of rolling mills.	6M	20ME305.4	L2
12 (b)	How are seamless tubes produced? Explain with neat diagram.	6M	20ME305.4	L2
OR				
13	Distinguish between forward extrusion and backward extrusion processes.	12M	20ME305.4	L2
14	Explain blanking and piercing operations.	12M	20ME305.5	L2
OR				
15	Explain the working principle of electromagnetic forming. Discuss the various advantages and applications.	12M	20ME305.5	L2



Semester End Regular/Supplementary Examination, Dec./Jan., 2022 - 2023

Degree	B. Tech. (U. G.)	Program	EEE			Academic Year	2022 - 2023
Course Code	20EE305	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Power Generation and Transmission						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two disadvantages of nuclear power plant.	20EE305.1	L1
2	Define the diversity factor.	20EE305.2	L1
3	Define GMR and GMD.	20EE305.3	L1
4	Recall surge impedance loading (SIL).	20EE305.4	L1
5	Mention any two methods of improving string efficiency.	20EE305.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK														
6	Explain the construction and working principle of thermal power plant.	12M	20EE305.1	L2														
OR																		
7	Explain the layout, classification and operation of hydro power plant.	12M	20EE305.1	L2														
8	<p>A generating station has the following daily load cycle :</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Time (Hrs)</th> <th>0-6</th> <th>6-10</th> <th>10-12</th> <th>12-16</th> <th>16-20</th> <th>20-24</th> </tr> </thead> <tbody> <tr> <td>Load (MW)</td> <td>40</td> <td>50</td> <td>60</td> <td>50</td> <td>70</td> <td>40</td> </tr> </tbody> </table> <p>Draw the load curve and find (i) maximum demand (ii) units generated per day (iii) average load and (iv) load factor.</p>	Time (Hrs)	0-6	6-10	10-12	12-16	16-20	20-24	Load (MW)	40	50	60	50	70	40	12M	20EE305.2	L3
Time (Hrs)	0-6	6-10	10-12	12-16	16-20	20-24												
Load (MW)	40	50	60	50	70	40												
OR																		
9	Explain the types of Tariff methods.	12M	20EE305.2	L2														
10	Derive the equation for inductance of a three phase over head line.	12M	20EE305.3	L3														
OR																		
11	Derive the equation for capacitance of a two-wire over head line.	12M	20EE305.3	L3														
12	Classify the types of transmission lines with model representations.	12M	20EE305.4	L2														
OR																		
13 (a)	Derive the expressions for the Performance of long transmission lines using rigorous method with relevant equations.	6M	20EE305.4	L3														
13 (b)	Using nominal π method, derive an expression for sending end voltage and current for a medium transmission line.	6M	20EE305.4	L3														
14	Explain the different methods used to improve the string efficiency of insulators with necessary diagrams.	12M	20EE305.5	L2														

OR				
15 (a)	Derive an expression for sag of a line supported between two supports of the same tower height.	8M	20EE305.5	L3
15 (b)	A 132 kV transmission line has the following data: Wt. of conductor = 680 kg/km; Length of span = 260 m Ultimate strength = 3100 kg; Safety factor = 2. Calculate the height above ground at which the conductor should be supported. Ground clearance required is 10 m.	4M	20EE305.5	L3

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Semester End Regular/Supplementary Examination, Dec./Jan., 2022-2023

Degree	B. Tech. (U. G.)	Program	ECE			Academic Year	2022 - 2023
Course Code	20EC305	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Digital System Design						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Draw and write the truth table for EXOR gate.	20EC305.1	L1
2	Give an example for Min term and Max term involving 3 Variables.	20EC305.2	L1
3	What is Carry Dependency?	20EC305.3	L1
4	What is Race round condition?	20EC305.4	L1
5	Expand VHDL.	20EC305.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Convert the following (i) $ABC_{16} = ()_{10}$ (ii) $154_8 = ()_{10}$ (iii) $695_{10} = ()_{16}$.	6M	20EC305.1	L2
6 (b)	Perform the given subtraction using 1's and 2's complement methods: $(11100011)_2 - (01110000)_2$.	6M	20EC305.1	L2
OR				
7	Explain basic gates with their truth table.	12M	20EC305.1	L2
8	Implement AND gate, OR gate, EXOR gate and Not gate using NAND gate only.	12M	20EC305.2	L2
OR				
9 (a)	Simplify the expression $Y = (A+B)(A'+C)(B'+C')$.	6M	20EC305.2	L2
9 (b)	Minimize the following function using Karnaugh map technique $f(A,B,C,D) = \sum_m(5,6,7,12,13) + \sum_d(4,9,14,15)$	6M	20EC305.2	L2
10 (a)	Design the full adder using two half adders.	6M	20EC305.3	L3
10 (b)	Design a 4-bit BCD adder circuit.	6M	20EC305.3	L3
OR				
11 (a)	Differentiate PAL, PROM, and PLA. Show and implement the following function using a PROM	6M	20EC305.3	L2
11 (b)	$F(w,x,y,z) = \sum_m(1,9,11,12,13,15)$ $G(w,x,y,z) = \sum_m(0,1,2,3,4,5,7,8,10,11,12,13,14,15)$	6M	20EC305.3	L3
12 (a)	Explain the working of JK Flip Flop.	6M	20EC305.4	L2
12 (b)	Explain the Conversion of SR Flip Flop to T Flip Flop.	6M	20EC305.4	L2
OR				
13	Design a 3 bit up counter using D-flip flop.	12M	20EC305.4	L3
14	Explain the program structure of VHDL and Explain the significance of entity and architecture.	12M	20EC305.5	L2
OR				
15	List and discuss various data types in VHDL with examples.	12M	20EC305.5	L2

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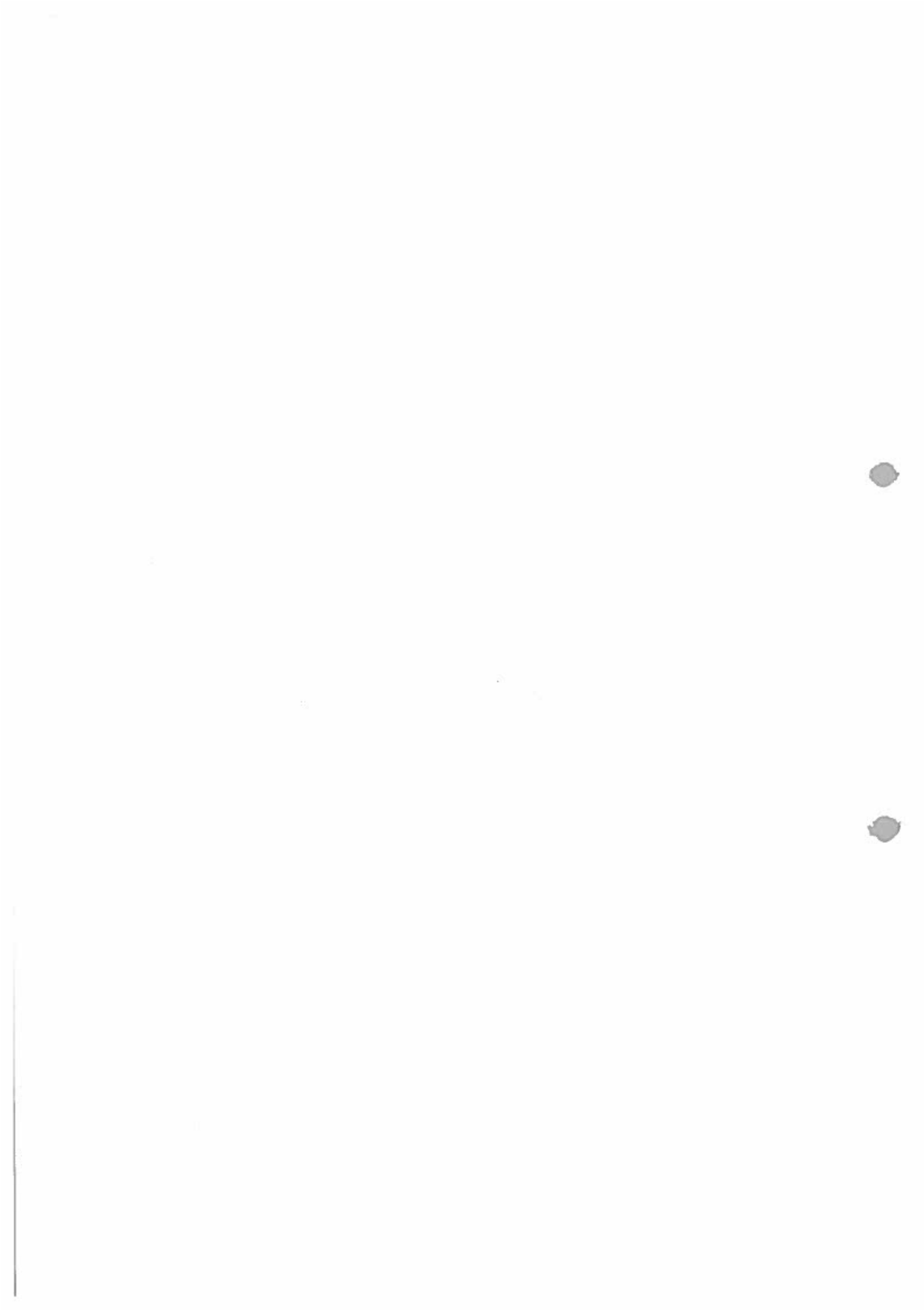


Semester End Regular/Supplementary Examination, Dec./Jan., 2022-2023

Degree	B. Tech.	Program	CSE, CSE (AI & ML) & CSE (DS)			Academic Year	2022 - 2023
Course Code	20CS305	Test Duration	3 Hrs.	Max. Marks	70	Semester	III
Course	Computer Organization						

Part A (Short Answer Questions 5 x 2 = 10 Marks)				
No.	Questions (1 through 5)		Learning Outcome (s)	DoK
1	What is the need of a shift Register?		20CS305.1	L1
2	What is an Interrupt?		20CS305.2	L1
3	What is the main purpose of the RISC?		20CS305.3	L1
4	What is signed magnitude method?		20CS305.4	L1
5	What are Peripherals?		20CS305.5	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)				
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Distinguish between fixed point representation and floating point representation.	6M	20CS305.1	L2
6 (b)	Define Decoder. Explain about 3 – to – 8 – line decoder.	6M	20CS305.1	L1
OR				
7 (a)	Explain about the error detection codes.	6M	20CS305.1	L2
7 (b)	With a neat sketch explain about multiplexers.	6M	20CS305.1	L2
8	Explain arithmetic, logic and shift micro-operations.	12M	20CS305.2	L2
OR				
9 (a)	Explain memory reference instructions with an example.	5M	20CS305.2	L2
9 (b)	Describe the various phases involved in the instruction cycle.	7M	20CS305.2	L2
10	What do you mean by addressing mode? Explain the addressing modes.	12M	20CS305.3	L2
OR				
11 (a)	How address sequencing is done in micro programmed control?	6M	20CS305.3	L2
11 (b)	Explain about stack organization.	6M	20CS305.3	L2
12 (a)	Explain the hardware implementation of signed magnitude addition and subtraction.	8M	20CS305.4	L2
12 (b)	Draw and explain the flowchart for booth multiplication algorithm.	4M	20CS305.4	L2
OR				
13 (a)	What is overflow and underflow in floating point arithmetic?	6M	20CS305.4	L2
13 (b)	Explain the difference between signed and unsigned division.	6M	20CS305.4	L2
14 (a)	Explain the methods employed for establishing priority using Daisy – Chaining priority.	6M	20CS305.5	L2
14 (b)	Describe the various components like input/output units, memory unit, control unit, arithmetic logic unit connected in the basic organization of a computer.	6M	20CS305.5	L2
OR				
15 (a)	Explain the method of DMA transfer in a computer system.	5M	20CS305.5	L2
15 (b)	Explain the concept of virtual memory. Why it is significant?	7M	20CS305.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	Civil Engineering	Academic Year	2022 - 2023
Course Code	20CE501	Test Duration	3 Hrs.	Max. Marks	70
Course	Structural Analysis	Semester	V		

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four methods used for computation of deflection in structure	20CE501.1	L1
2	Write the general equations for finding out the moment in a beam AB by using slope deflection equation	20CE501.2	L2
3	Define carryover moment	20CE501.3	L1
4	Compare the two hinged and three hinged arches	20CE501.4	L2
5	Define Influence Line Diagram	20CE501.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Analyze the pin jointed trussas shown in figure 1 by the method of section	12M	20CE501.1	L3

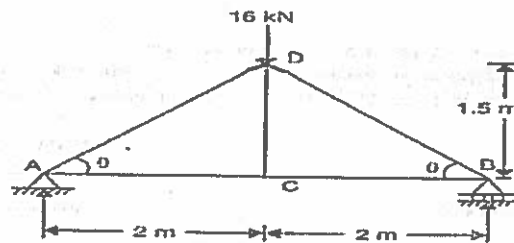


Figure 1

OR

7	State and explain the Castiglianoes theorem - 1	12M	20CE501.1	L2
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Analyze the continuous beam ABCD shown in Figure 3. By slope deflection method. Take $EI = \text{Constant}$. Also sketch the shear force and Bending Moment diagram.

8	Analyze the continuous beam ABCD shown in Figure 3. By slope deflection method. Take $EI = \text{Constant}$. Also sketch the shear force and Bending Moment diagram.	12M	20CE501.2	L3
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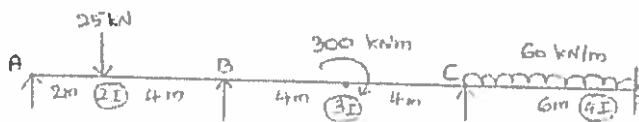


Figure 3

OR

Analyze the portal frame shown in Figure 4 by slope deflection method and draw the B.M.D

9	Analyze the portal frame shown in Figure 4 by slope deflection method and draw the B.M.D	12M	20CE501.2	L3
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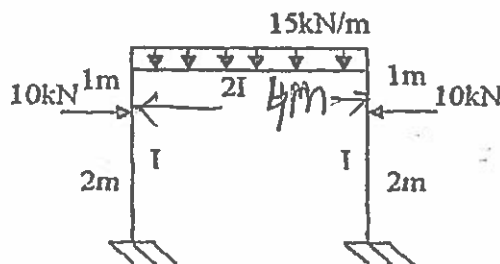
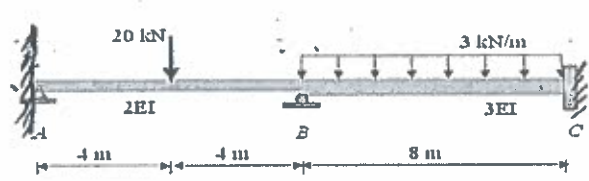
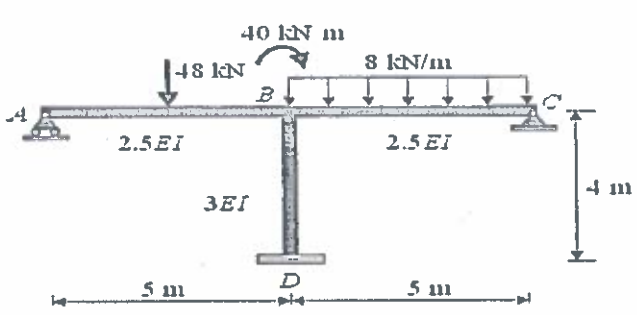


Figure 4

10	<p>Analyze the portal frame shown in Figure 5 by moment distribution method and draw the B.M.D</p>  <p style="text-align: center;">Figure 5</p>	12M	20CE501.3	L3
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OR

11	<p>Analyze the portal frame shown in Figure 6 by moment distribution method and draw the B.M.D</p>  <p style="text-align: center;">Figure 6</p>	12M	20CE501.3	L3
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12	<p>A symmetrical two-hinged parabolic arch has a span of 13 m and a rise to the central hinge of 3 m. It carries a vertical load of 15 kN at 3m from the left hand end. Analyze and find i) Find the vertical and horizontal at the support ii) Bending moment at 5m from the left hand hinge</p>	12M	20CE501.3	L2
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OR

13	<p>A three hinged parabolic arch has supports at different levels having span 20 m and carries a UDL of 30 kN/m over the left half of the span. The left support is 5m below the crown and the right support is 4 m below the crown. Find the maximum positive bending moment. Also analyze and find the normal thrust and radial shear at a section 4m from the left support.</p>	12M	20CE501.4	L3
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14.	<p>Uniformly distributed load of intensity 30 KN/M, crosses a simply supported span of 60 m from left to right. The length of the UDL is 15 m. Find the value of maximum S.F maximum B.M at a section of 20 m from left end. Find also the absolute value of maximum B.M of the S.F in the section.</p>	12M	20CE501.5	L3
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OR

15	<p>A uniformly distributed load of 5 kN/m at a distance of 10 m moves on a girder of span 30 m moves from left to right. Determine (i) Maximum positive and negative Shear force and (ii) Bending moment for a section 5m from the left support (ii) Also find absolute maximum moment.</p>	12M	20CE501.5	L3
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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	Mechanical Engineering			Academic Year	2022 - 2023
Course Code	20ME501	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Dynamics of Machinery						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write any two applications of gyroscopic principle.	20ME501.1	L1
2	List any two types of brake and dynamometers.	20ME501.2	L1
3	What are the uses of turning moment diagram?	20ME501.3	L1
4	What is balancing of reciprocating engines?	20ME501.4	L1
5	What is meant by forced vibrations?	20ME501.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	The moment of inertia of an aeroplane air screw is 20 kg/m^2 and rotates at 3000 rpm clockwise when viewed from aft. If the ship pitches with angular simple harmonic motion having a periodic time of 16 seconds and amplitude of 0.1 radian, find the a) maximum angular velocity of the rotor axis, b) maximum value of the gyroscopic couple and c) gyroscopic effect as the bow dips.	12M	20ME501.1	L3
OR				
7	A four-wheeled trolley car of mass 2500 kg runs on rails, which are 1.5 m apart and travels around a curve of 30 m radius at 24 km / hr. The rails are at the same level. Each wheel of the trolley is 0.75 m in diameter and each of the two axles is driven by a motor running in a direction opposite to that of the wheels at a speed of five times the speed of rotation of the wheels. The moment of inertia of each axle with gear and wheels is 18 kg-m^2 . Each motor with shaft and gear pinion has a moment of inertia of 12 kg-m^2 . The centre of gravity of the car is 0.9 m above the rail level. Determine the vertical force exerted by each wheel on the rails taking into consideration the centrifugal and gyroscopic effects. State the centrifugal and gyroscopic effects on the trolley.	12M	20ME501.1	L3
8	Classify different dynamometers and explain proney brake and rope brake dynamometers with neat sketches.	12M	20ME501.2	L2
OR				
9	A single plate clutch is required to transmit 36 HP at 1600 rpm. The outside diameter of the plate is 30 cm, intensity of pressure is 0.7 kg/cm^2 . Assume the uniform wear and a coefficient of friction is 0.3. Find the required inner diameter of the plates and axial force necessary to engage the clutch.	12M	20ME501.2	L3
10 (a)	A centrifugal Watt governor is fitted with two balls, each of mass 2.5 kg. Find the height of the governor when it is running at 75 rpm. Also find the speed of the governor when the balls rise by 20 mm and fall by 20 mm. Neglect friction of the governor.	6M	20ME501.3	L3
10 (b)	Explain centrifugal governor with a neat sketch.	6M	20ME501.3	L2

OR

11	The mass of flywheel of an engine is 6.5 tonnes and the radius of gyration is 1.8 metres. It is found from the turning moment diagram that the fluctuation of energy is 56 kN-m. If the mean speed of the engine is 120 r.p.m., find the maximum and minimum speeds.	12M	20ME501.3	L3
12	A three cylinder radial engine has axes of 120° to one another and their connecting rods are coupled to a single common crank. The stroke length is 100 mm and length of each connecting rod is 150 mm. if the mass of reciprocating parts per cylinder is 1 kg, find the primary and secondary force of the engine running at 2400 rpm.	12M	20ME501.4	L3
OR				
13	A vee-twin engine has the cylinder axes at right angles and the connecting rods operate with a common crank. The reciprocating mass per cylinder is 11.5 kg and the crank radius is 75 mm. The length of the connecting rod is 0.3 m. Show that the engine may be balanced for primary forces by means of a revolving balance mass. If the engine speed is 500 r.p.m. What is the value of maximum resultant secondary force?	12M	20ME501.4	L3
14	Explain whirling of shafts and derive the expression for the critical speed of shaft.	12M	20ME501.5	L2
OR				
15	A shaft of 100 mm diameter and 1 m long has one of its end fixed and the other end carries a disc of mass 500 kg at a radius of gyration of 450 mm. The modulus of rigidity for the shaft material is 80 GN/m ² . Determine the frequency of torsional vibrations.	12M	20ME501.5	L3

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	EEE	Academic Year	2022 - 2023
Course Code	20EE501	Test Duration	3 Hrs.	Max. Marks	70
Course	Power Distribution and Distributed Generation				
				Semester	V

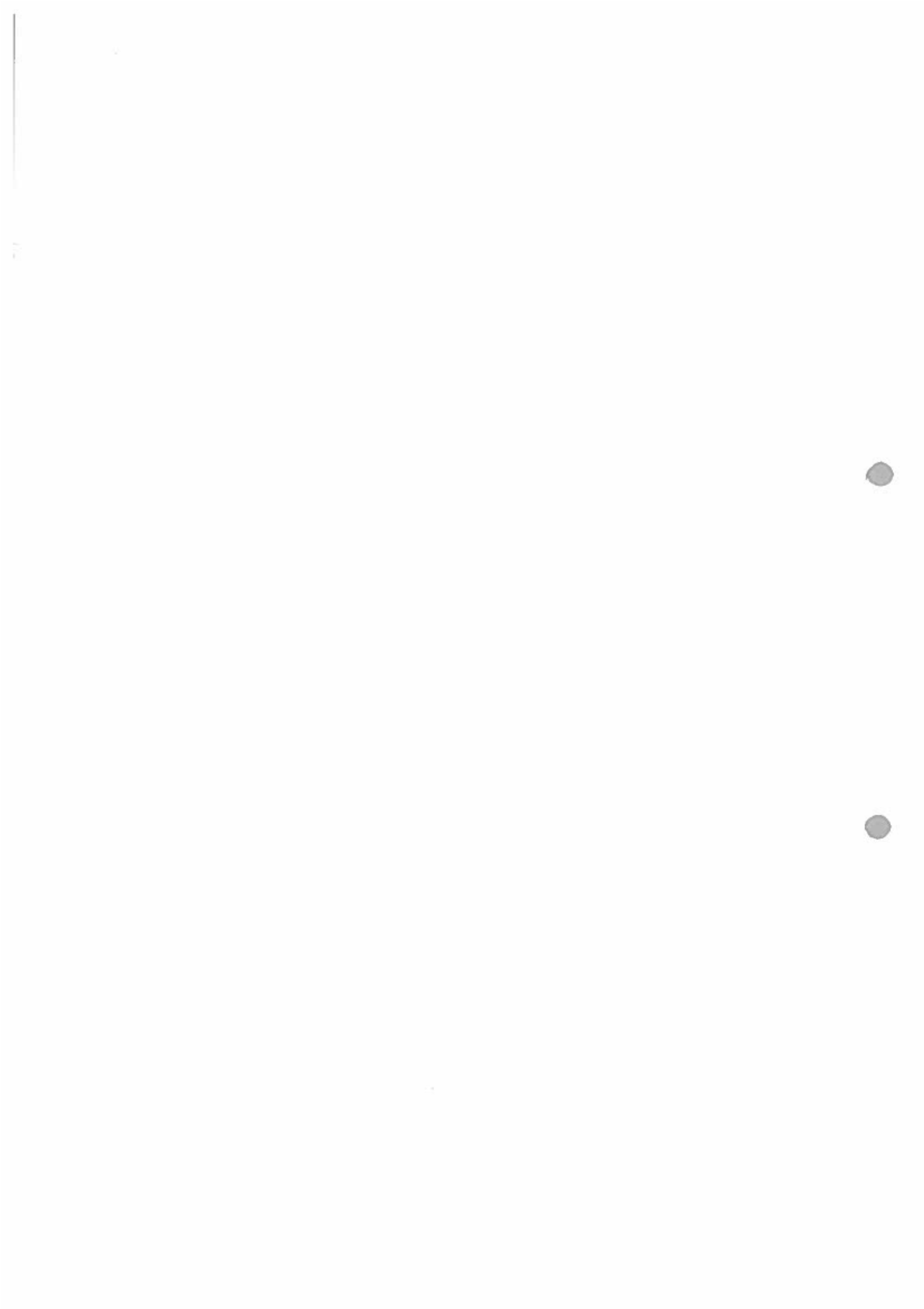
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define loss factor.	20EE501.1	L1
2	List any four needs of service mains.	20EE501.2	L1
3	Recall the need of distributed generation.	20EE501.3	L2
4	Write the purpose of fly wheel used in mechanical storage system.	20EE501.4	L2
5	Define marginal cost.	20EE501.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Explain the classification of loads and their characteristics.	12M	20EE501.1	L2
OR				
7 (a)	Discuss the relationship between load factor and loss factor.	7M	20EE501.1	L2
7 (b)	A feeder supplies 2.5MW to an area. The total losses at peak loss are 100 kW and units supplied to that area during a year are 3.6×10^6 . Determine the loss factor and average power loss.	5M	20EE501.1	L3
8	Explain the benefits derived through optimal location of substations.	12M	20EE501.2	L2
OR				
9	Describe the basic design practice of secondary distribution system.	12M	20EE501.2	L2
10	Explain the difference between Distributed Generation and Central Station Generation.	12M	20EE501.3	L2
OR				
11	Explain the Load curve analysis and how it is useful for measuring load curve data accurately.	12M	20EE501.3	L2
12 (a)	Explain the planning process.	7M	20EE501.4	L2
12 (b)	Describe energy storage elements.	5M	20EE501.4	L2
OR				
13	Describe the working principle and operation of ultra-capacitor with necessary diagram.	12M	20EE501.4	L2
14 (a)	Explain the decision based cost effective evaluation.	8M	20EE501.5	L2
14 (b)	Explain time value of money.	4M	20EE501.5	L2
OR				
15	Explain about reliability evaluation of Distributed Generation based systems.	12M	20EE501.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	ECE	Academic Year	2022 - 2023
Course Code	20EC501	Test Duration	3 Hrs.	Max. Marks	70
Course	Analog and Digital Communications				
				Semester	V

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define amplitude modulation and draw the single tone AM signal waveform.	20EC501.1	L1
2	Define frequency deviation in FM.	20EC501.2	L1
3	What is quantization error?	20EC501.3	L1
4	Draw the block diagram of Coherent detection of FSK.	20EC501.4	L2
5	Define entropy.	20EC501.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain how the amplitude modulation can be expressed in time domain and frequency domain	6M	20EC501.1	L2
6 (b)	Explain the generation of SSB by using the phase discrimination method.	6M	20EC501.1	L2
OR				
7 (a)	Explain the generation technique of an AM wave using the square law modulator.	7M	20EC501.1	L2
7 (b)	Compare different types of AM systems in terms of its merits and demerits.	5M	20EC501.1	L3
8	Define modulation index in FM. Discuss the spectra of NBFM and WBFM for various modulation indices.	12M	20EC501.2	L2
OR				
9 (a)	Draw the block diagram of Super-heterodyne Receiver and explain each block.	6M	20EC501.2	L2
9 (b)	Show that Narrow band FM is equivalent to AM with respect to transmission bandwidth.	6M	20EC501.2	L3
10 (a)	Explain the term Quantization and its types.	4M	20EC501.3	L2
10 (b)	Derive the output signal power to quantization noise in a PCM system.	8M	20EC501.3	L3
OR				
11	Explain the operation of delta modulation in detail and its drawbacks along with necessary expressions	12M	20EC501.3	L3
12 (a)	Draw and explain the power spectral density (PSD) and geometrical representation of BPSK.	8M	20EC501.4	L2
12 (b)	Write any two comparisons among ASK and FSK.	4M	20EC501.4	L2
OR				
13 (a)	Derive an expression for signal to noise ratio for integrator and dump filter.	7M	20EC501.4	L3
13 (b)	Derive an expression for error probability of ASK.	5M	20EC501.4	L3

14 (a)	Define information and explain its properties	6M	20EC501.5	L2
14 (b)	Define channel capacity and explain channel capacity for discrete channels.	6M	20EC501.5	L2
OR				
15 (a)	Explain about the trade-off between bandwidth and S/N ratio.	8M	20EC501.5	L2
15 (b)	What are the advantages of source coding techniques? Explain any one of the source coding technique steps.	4M	20EC501.5	L2

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Semester End Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	CSE	Academic Year	2022 - 2023
Course Code	20CS501	Test Duration	3 Hrs.	Max. Marks	70
Course	Java Programming			Semester	V

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Why is Java known as platform independent?	20CS501.1	L1
2	What is the use of super keyword?	20CS501.2	L1
3	What are the advantages of multithreading?	20CS501.3	L1
4	How do applets differ from application program?	20CS501.4	L1
5	Draw AWT Class Hierarchy.	20CS501.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the concept of Type Conversion and Type Casting in Java with a Suitable Java Program?	6M	20CS501.1	L2
6 (b)	What is Recursion and Write a Java Program to display a Factorial of a number using Recursion?	6M	20CS501.1	L3

OR

7 (a)	Discuss various loop statements and branching statements available in Java? Show their Syntax.	6M	20CS501.1	L2
7 (b)	Discuss about java Buzzwords?	6M	20CS501.1	L2
8 (a)	Differentiate Method Overloading and Method Overriding.	6M	20CS501.2	L2
8 (b)	What is Inheritance? Explain the different types of Inheritance Mechanisms in Java with an example for each?	6M	20CS501.2	L2

OR

9 (a)	Define Constructor and Explain the different types of Constructors in Java with a suitable example	6M	20CS501.2	L2
9 (b)	With suitable code segments illustrate various uses of 'final' keyword.	6M	20CS501.2	L3

10 (a)	Explain Multithreading with an example.	6M	20CS501.3	L2
10 (b)	Write a Java Program that demonstrates the use of Abstract Class and Interface?	6M	20CS501.3	L3

OR

11 (a)	Explain the thread life cycle with neat diagram	6M	20CS501.3	L2
11 (b)	Explain thread priorities in Java. Write a java program using thread priorities	6M	20CS501.3	L2

12 (a)	Define Applet. What are the uses of applet?	6M	20CS501.4	L1
12 (b)	Write the HTML Applet Tag and explain each part of it.	6M	20CS501.4	L2

OR

13 (a)	Write a java program to read and count the characters from files.	6M	20CS501.4	L3
13 (b)	Distinguish between i. Input Stream and Reader classes ii. Output Stream and Writer Classes	6M	20CS501.4	L2

14 (a)	Explain the concept of AWT Button and AWT Text Field with suitable example	6M	20CS501.5	L2
14 (b)	Difference between Adapter classes and Inner classes.	6M	20CS501.5	L2

OR

15 (a)	List out various layout managers in Java. Write a java program for Border Layout class in Java.	6M	20CS501.5	L3
15 (b)	Demonstrate the mouse related events with java program	6M	20CS501.5	L3

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	CSE (AI & ML) & CSE (DS)	Academic Year	2022 – 2023
Course Code	20CS405	Test Duration	3 Hrs.	Max. Marks	70
Course	Theory of Computation				
				Semester	V

Part A (Short Answer Questions 5 x 2 = 10 Marks)

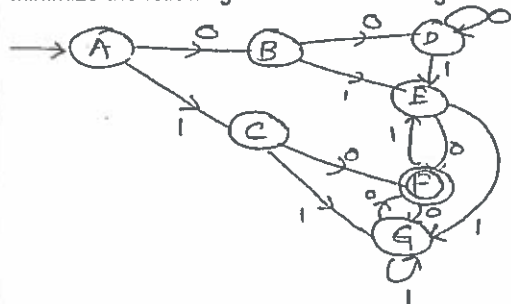
No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Give the formal definition of Moore machine	20CS405.1	L1
2	List any two applications of PDA	20CS405.2	L1
3	What is undecidability?	20CS405.3	L1
4	List the two types of Parsers	20CS405.4	L1
5	Translate the following expression into Three address code $a^*(b+c)$	20CS405.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Let $\Sigma = \{a, b\}$, Design DFA that accepts any string with "aababb" as a substring	6M	20CS405.1	L3
6 (b)	Design DFA to accept strings of a's and b's having even number of a's and b's	6M	20CS405.1	L3

OR

Minimize the following DFA shown in the figure below



7		12M	20CS405.1	L3
8 (a)	Given CFG $G = (\{S, A\}, \{a, b\}, P, S)$ where P consists of $S \rightarrow aAS \mid a$ $A \rightarrow SbA \mid SS \mid ba$ Give the LMD, RMD and parse tree for the string "aabbaa"	6M	20CS405.2	L3
8 (b)	Design a PDA for the language $L = \{ww^R \mid w \in \{0, 1\}^*\}$, R stands for Reverse	6M	20CS405.2	L3

OR

9	Convert the following grammar to Chomsky Normal Form $S \rightarrow ABA$ $A \rightarrow aA \mid \epsilon$ $B \rightarrow bB \mid \epsilon$ and simplify the grammar	12M	20CS405.2	L3
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10	Design TM for performing proper subtraction of two numbers	12M	20CS405.3	L3
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OR

11 (a)	Explain Various Types of Turing Machines	6M	20CS405.3	L2
11 (b)	Explain Church Turing Thesis	6M	20CS405.3	L2
12 (a)	Describe the role performed by lexical analysis of the compiler	6M	20CS405.4	L2
12 (b)	Write the steps to perform FIRST and FOLLOW function	6M	20CS405.4	L2

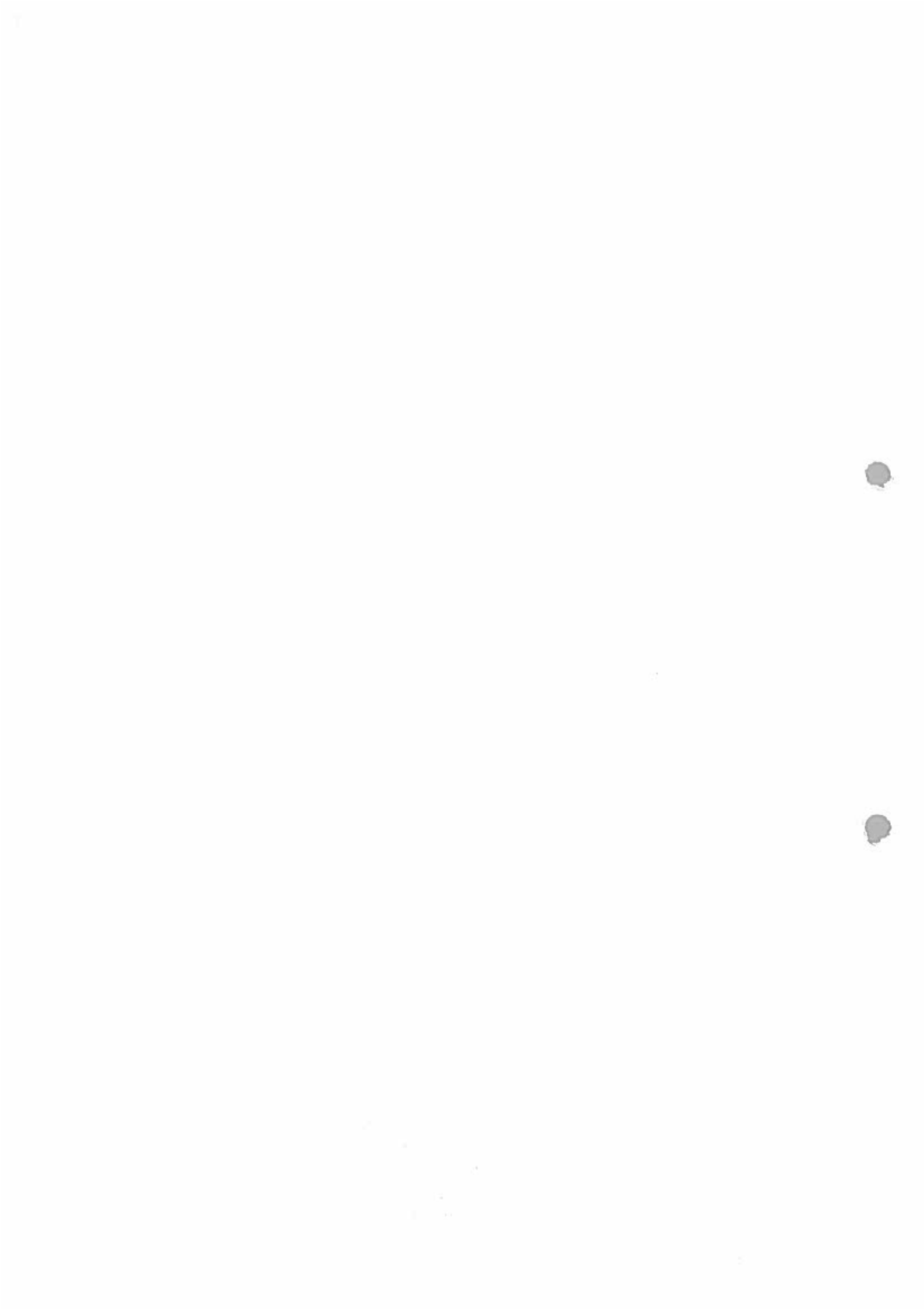
OR

13	Define Compiler, Explain the Phases of compiler, and how the following statement will be translated into every phase Position:=initial+rate*60	12M	20CS405.4	L2
14	Define a DAG. Construct a DAG and write the sequence of instructions for the following expression $a+a*(b-c)+(b-c)*d$	12M	20CS405.5	L3

OR

15	Write short notes on a. Peephole optimization technique b. Global data flow analysis	12M	20CS405.5	L2
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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	Civil Engineering		Academic Year	2022 - 2023
Course Code	20CE502	Test Duration	3 Hrs.	Max. Marks	70	Semester
Course	Design of Reinforced Concrete Elements					

Note: IS: 456 – 2000 and SP- 16 Charts are allowed into the examination hall
Assume the missing data

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four assumptions made in the Limit state of Design.	20CE502.1	L1
2	Mention the need for corner reinforcement in two way rectangular slabs whose corners are prevented from lifting up.	20CE502.2	L2
3	What are the limits of percentage of the longitudinal reinforcement in a column?	20CE502.3	L1
4	When combined footing is being provided?	20CE502.4	L2
5	List all the types of water tanks.	20CE502.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Write the assumptions in limit state of collapse in flexure. Draw the stress block parameters for singly reinforced section in Limit state Method.	4M	20CE502.1	L3
6 (b)	Explain the design procedure for a singly reinforced beam.	8M	20CE502.1	L3

OR

7	Design T-beam for the following data: Width of flange = 2400 mm Breadth of beam = 300 mm Total Depth = 450 mm Thickness of slab = 130 mm Ultimate moment = 850 kN.m Use M 20 grade of concrete and Fe 415 grade of steel.	12M	20CE502.1	L3
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8	Design a continuous slab for a hall of 6.5 m x 13.5 m is casted monolithically with the beams of width 230 mm to support a live load of 2 kN/m ² and floor finish load 1.5 kN/m ² . Use M 20 grade concrete and Fe 415 grade steel.	12M	20CE502.2	L4
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OR

9	Design a R.C. slab for a room measuring 6 m x 8 m size. The slab is simply supported on all four edges, with corners held down and carries a superimposed load of 3 kN/m ² inclusive of floor finishes etc. Use M20 Grade concrete and Fe 415 Steel.	12M	20CE502.2	L4
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10	A short R.C column of M 20 grade concrete, 300 mm X 480 mm in section is reinforced with 10 bars of 16 mm diameter of Fe 415 with an effective cover of 60 mm distributed equally among all edges. Check the safety of the column if it is subjected to ultimate axial load 1000 kN, ultimate B.M. of M_{ux} = 80 kNm and an ultimate B.M. of M_{uy} = 50 kNm. Check the safety of the column	12M	20CE502.3	L4
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OR

11	A circular column, 4.6 m high is effectively held in position at both ends and restrained against rotation at one end. Design the column, to carry an axial load of 1200 KN, if its dia is restricted to 450 mm. Use M20 and Fe 415 grades.	12M	20CE502.3	L4
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12	Design a footing for the column of 300 mm in square to carry an axial load of 1000 kN on a soil having bearing capacity of 160 kN/mm ² by using M25 grade concrete and Fe 500 grade steel	12M	20CE502.4	L4
OR				
13	Design a suitable footing for a R.C. column of size 300 mm x 500 mm. Supporting a factored axial load of 1500 KN. Assume safe bearing capacity of soil as 200 KN/m ² . Adopt M20 grade and Fe415 grades. Sketch the details at reinforcements in footings.	12M	20CE502.4	L4
14	Explain principle of working stress method with assumptions.	12M	20CE502.5	L2
OR				
15	Explain the design principle of cantilever retaining wall.	12M	20CE502.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	Mechanical Engineering	Academic Year	2022 - 2023
Course Code	20ME502	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Design of Machine Elements-I				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What are the various phases of design?	20ME502.1	L1
2	What is meant by fatigue stress concentration factor?	20ME502.2	L1
3	List any 4 advantages of bolted joints over welded joints.	20ME502.3	L1
4	What is the use of universal coupling?	20ME502.4	L1
5	Recall the stresses in Helical Springs of circular wire.	20ME502.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw the stress strain diagrams of Ductile materials and Brittle materials.	6M	20ME502.1	L2
6 (b)	A steel saw blade 1 mm thick is bent into an arc of a circle of 50 cm radius. Determine the flexural stresses induced and the bending moment required bending the blade which is 15 mm wide. Take $E = 2.1 \times 10^5 \text{ N/mm}^2$.	6M	20ME502.1	L3
OR				
7 (a)	Explain the manufacturing considerations in design.	6M	20ME502.1	L2
7 (b)	A cast iron pulley transmits 10 KW at 400 rpm. The diameter of the pulley is 1.2 meter and it has four straight arms of elliptical cross section. In which the major axis is twice the minor axis. Determine the dimensions of the arm if the allowable bending stress is 15 MPa.	6M	20ME502.1	L3
8 (a)	Define fatigue, endurance limit, stress concentration and notch sensitivity.	6M	20ME502.2	L1
8 (b)	Determine the thickness of a 120 mm wide a uniform plate for safe continuous operation if the plate is to be subjected to a tensile load that has a maximum value of 250 kN and a minimum value of 100 kN. The properties of the plate material are as follows: Endurance limit stress 225 MPa, and yield point stress 300 MPa. The factor of safety based on yield point may be as 1.5	6M	20ME502.2	L3
OR				
9 (a)	Explain the factors that affect the fatigue strength.	6M	20ME502.2	L2
9 (b)	A simply supported beam has a concentrated load at the center, which fluctuates from a value of P to 4 P. The span of the beam is 0.5 m and its cross-section is circular with a diameter of 0.06 m. Taking for the beam material an ultimate stress of 700 MPa, a yield stress of 500 MPa, endurance limit of 330 MPa for reversed bending, and a factor of safety of 1.3, calculate the maximum value of P. Take a size factor of 0.85 and a surface finish factor of 0.9.	6M	20ME502.2	L3
10 (a)	What do you understand by the terms riveted joint and welded joints?	6M	20ME502.3	L1
10 (b)	Two plates 16 mm thick are joined by a double riveted lap joint. The pitch of each row of rivets is 90 mm. The rivets are 25 mm in diameter. The permissible stresses are 140 MPa in tension, 80 MPa in shear and 160 MPa in crushing. Find the efficiency of the joint.	6M	20ME502.3	L3

OR

11 (a)	List any 6 applications of sleeve and cotter joints. Design a sleeve and cotter joint to resist a tensile load of 60 Km all	6M	20ME502.3	L1
11 (b)	parts of the joints are made of the same material with the following allowable stresses: $\sigma_t = 60$ MPa, $\tau = 70$ MPa, $\sigma_c = 125$ MPa.	6M	20ME502.3	L3
12 (a)	Write about the uses of internal and external circlips with neat sketch.	6M	20ME502.4	L2
12 (b)	Compare weight, strength and stiffness of two shafts of same material subjected to same torque. One being solid, other being hollow with inner diameter to outer diameter ratio 0.5.	6M	20ME502.4	L2
OR				
13	Write about the rigid couplings and its type with neat diagram.	12M	20ME502.4	L2
14 (a)	Explain about the co-axial springs. A helical spring is made from a wire of 6 mm diameter and has outside diameter of 75 mm. If the permissible shear stress is 350 MPa and modulus of rigidity 84 Kn/MM ² , find the axial load which the spring can carry and the deflection per active turn.	4M	20ME502.5	L2
14 (b)		8M	20ME502.5	L3
OR				
15 (a)	Define spring. What is the purpose of mechanical springs? A truck spring has 12 number of leaves, two of which are full length leaves. The spring supports are 1.05 m apart and the central band is 85 mm wide. The central load is to be 5.4 KN with a permissible stress of 280 MPa. Determine the thickness and width of the steel spring leaves. The ratio of the total depth to the width of the spring is 3. Also determine the deflection of the spring.	6M	20ME502.5	L1
15 (b)		6M	20ME502.5	L3

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Semester End Regular Examination, Nov./Dec., 2022

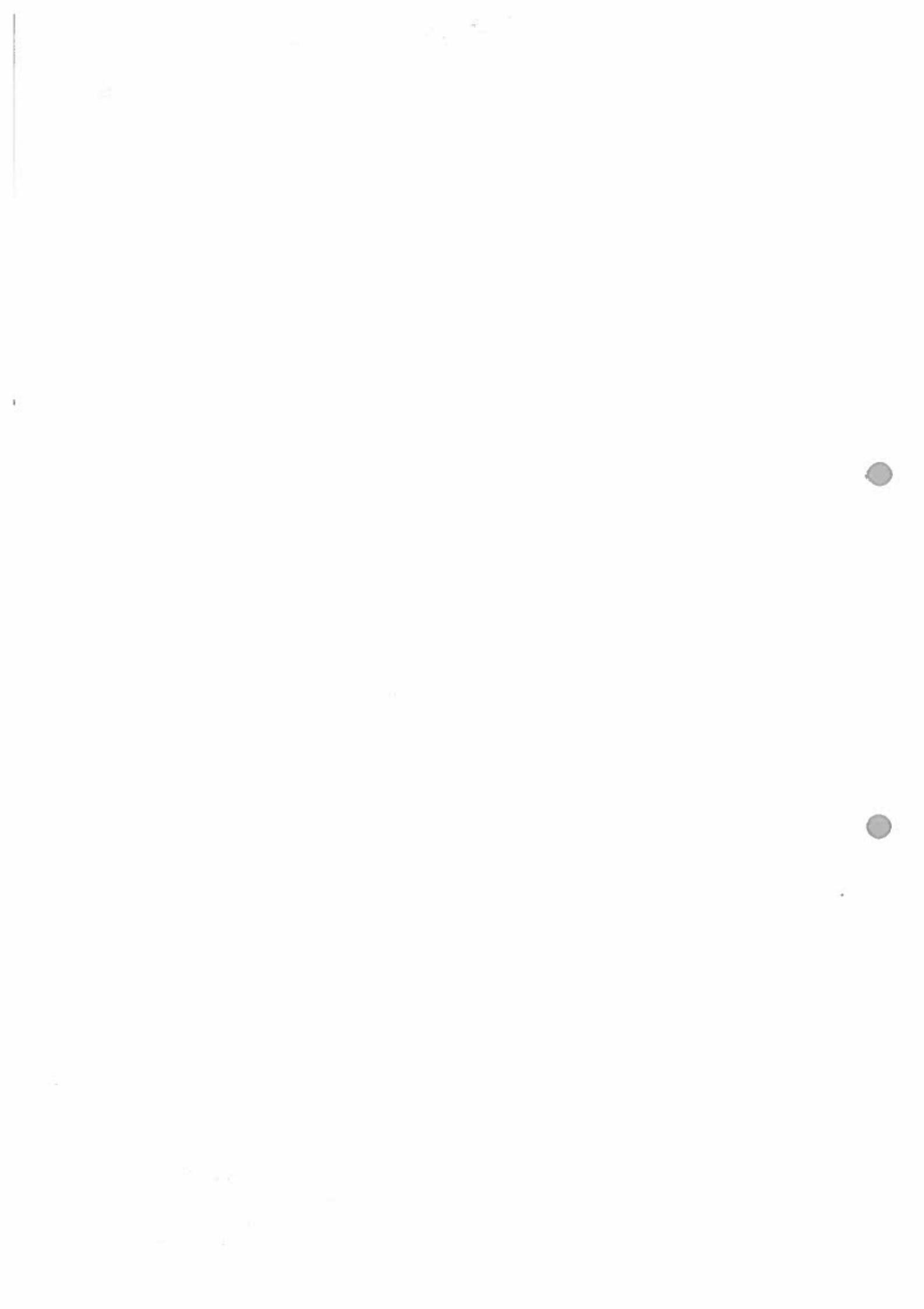
Degree	B. Tech.	Program	EEE	Academic Year	2022-2023
Course Code	20EE502	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Power Electronics				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Draw the output characteristics of power MOSFET.	20EE502.1	L1
2	At what conditions fully control rectifier will act as a line commutated inverter.	20EE502.2	L1
3	What are the control strategies for the regulation of output voltage in ac voltage controllers?	20EE502.3	L1
4	A step-up chopper is supplied from a 110V DC source. The voltage required by the load is 440V. if the switch is turned on for 0.25ms find the chopper frequency?	20EE502.4	L2
5	List any 4 methods for reduction of harmonics in the output voltage of inverters.	20EE502.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	For a power diode reverse recovery time is $3.9 \mu\text{s}$ and the rate of diode current decay is $50 \text{ A}/\mu\text{s}$. For a softness factor of 0.3, calculate the peak inverse current and storage charge.	6M	20EE502.1	L2
6 (b)	List any 6 differences between SCR, IGBT & BJT.	6M	20EE502.1	L2
OR				
7	Draw the switching characteristics of SCR, define delay time, rise time, spread time, reverse recovery time, gate recovery time and device turn off time	12M	20EE502.1	L2
8 (a)	Draw the circuit diagram of a single-phase half wave-controlled rectifier with RL load and derive the expression for r.m.s. output voltage.	6M	20EE405.2	L2
8 (b)	What is the effect of source inductance on the output waveform of 1-phase full controlled converter?	6M	20EE405.2	L2
OR				
9	Describe the working principle of a single phase fully controlled bridge converter for rectifying and inverting modes. Draw the relevant load voltage waveforms for firing angle $\alpha = 45^\circ$ & 120° .	12M	20EE502.2	L3
10	A 3-phase full converter charges a battery from a three-phase supply of 230 V, 50 Hz. The battery emf is 200 V and its internal resistance is 0.5Ω . On account of inductance connected in series with the battery, charging current is constant at 20 A. Compute the firing angle delay and supply power factor.	12M	20EE502.3	L3
OR				
11 (a)	Describe working of 1-Phase AC-AC regulators with R load only and draw the relevant waveforms.	6M	20EE405.3	L2
11 (b)	Discuss in detail the principle of operation of a circulating current mode dual converter. Compare circulating and circulating current free dual converter.	6M	20EE405.3	L2
12	Explain the operating principle of dc chopper with a suitable diagram. Draw the voltage and current waveforms of Buck chopper. Derive expressions for output voltage volt sec balance.	12M	20EE405.4	L2
OR				
13	With the help of a neat circuit diagram and associated waveforms, discuss the operation of Buck-Boost converter and derive expressions for output voltage volt sec balance.	12M	20EE405.4	L2
14	Explain the working of a 1-phase half bridge, full bridge Inverter with RL load. Draw the relevant output waveforms.	12M	20EE405.5	L2
OR				
15	With suitable circuit diagrams and wave forms explain the operation of a three phase inverter in 180° mode?	12M	20EE405.5	L2



Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	ECE	Academic Year	2022 - 2023
Course Code	20EC502	Test Duration	3 Hrs.	Max. Marks	70
Course	Linear and Digital IC Applications				
				Semester	V

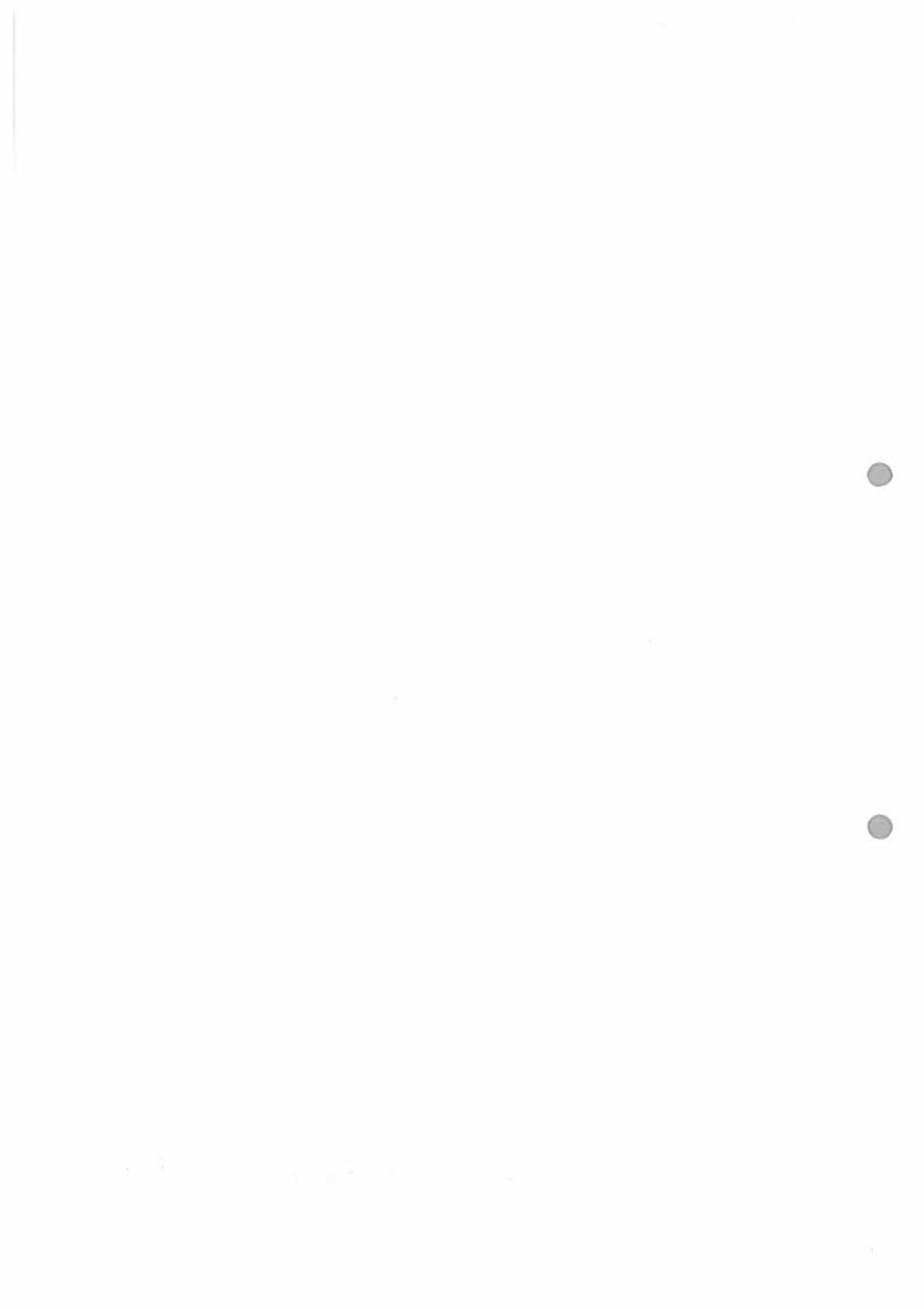
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Sketch the Integrator and Differentiator circuit using IC 741.	20EC502.1	L1
2	List any two applications of VCO.	20EC502.2	L1
3	Differentiate R-2R and Inverted R-2R DAC methods.	20EC502.3	L2
4	Draw the circuit diagram of CMOS NAND circuit.	20EC502.4	L1
5	List any two IC's used for Adders.	20EC502.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Draw the circuit diagram of Inverting Amplifier and Non Inverting Amplifier and explain its operation.	12M	20EC502.1	L2
OR				
7	Explain the D.C. characteristics of an Op-Amp.	12M	20EC502.1	L2
8 (a)	Explain the working of an Astable Multivibrator using 555 timer with relevant circuit and Waveforms and derive the expression for frequency of operation and duty cycle.	8M	20EC502.2	L2
8 (b)	Design a 555 based Astable Multivibrator to generate an output signal with frequency 2.5KHz and duty cycle of 50%(C=0.01uF).	4M	20EC502.2	L3
OR				
9	Explain the working of PLL and derive an expression for the lock-in range of a PLL.	12M	20EC502.2	L2
10	Explain Successive Approximation ADC with neat diagram.	12M	20EC502.3	L2
OR				
11	Explain the binary weighted resistor and R-2R type DAC with necessary equations and write any 4 advantages and disadvantages.	12M	20EC502.3	L2
12	Explain the 2 input TTL NAND gate logic in detail with neat sketch and its truth table.	12M	20EC502.4	L2
OR				
13	Realize a CMOS OR and NOR gate using CMOS Logic with function table	12M	20EC502.4	L3
14 (a)	Discuss the Magnitude Comparator (IC7485).	4M	20EC502.5	L2
14 (b)	Explain any two 74 Series combinational logic IC's with example.	8M	20EC502.5	L2
OR				
15	Explain the concept of Universal Shift Register with necessary diagrams.	12M	20EC502.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	CSE & CSE (AI & ML)	Academic Year	2022 – 2023
Course Code	20AI502	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Artificial Intelligence				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four applications of AI.	20AI502.1	L1
2	Distinguish between toy and real-world problems.	20AI502.2	L1
3	Define propositional calculus.	20AI502.3	L1
4	List the four kinds of knowledge approaches which need to be represented in the AI system.	20AI502.4	L1
5	Mention some applications of expert system.	20AI502.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the four categories AI system.	6M	20AI502.1	L2
6 (b)	Summarize the applications of Artificial Intelligence.	6M	20AI502.1	L2
OR				
7 (a)	How intelligence and artifact do helps artificial intelligence to succeed?	6M	20AI502.1	L2
7 (b)	Summarize the six foundations that compose most of AI concepts.	6M	20AI502.1	L2
8 (a)	Define state space search. Solve the water jug problem using production rules.	6M	20AI502.2	L2
8 (b)	Explain the various types hill climbing algorithm heuristic search techniques.	6M	20AI502.2	L2
OR				
9 (a)	Discuss how well the standard approach to game playing would apply to games such which take place in a continuous physical state space.	6M	20AI502.2	L2
9 (b)	Compare Greedy best-first search and A* search strategies.	6M	20AI502.2	L2
10 (a)	Explain predicate logic with suitable example.	6M	20AI502.3	L2
10 (b)	Write the propositional resolution refutation with an example.	6M	20AI502.3	L2
OR				
11 (a)	Explain semantic tableau calculus for classical propositional logic.	6M	20AI502.3	L2
11 (b)	Discuss some examples of axiomatic systems.	6M	20AI502.3	L2
12 (a)	Explain the knowledge representation using semantic networks.	6M	20AI502.4	L2
12 (b)	Summarize the four approaches to knowledge representation in AI.	6M	20AI502.4	L2
OR				
13 (a)	Explain how conceptual dependency is used to represent knowledge acquired from natural language input.	6M	20AI502.4	L2
13 (b)	Explain the components of script with an example of restaurant.	6M	20AI502.4	L2
14 (a)	Summarize the applications of the expert system.	6M	20AI502.5	L2
14 (b)	Explain the phases in building an expert system.	6M	20AI502.5	L2
OR				
15 (a)	Compare the expert system and traditional system with an example.	6M	20AI502.5	L2
15 (b)	Explain the truth maintenance system with an example.	6M	20AI502.5	L2

Semester End Regular Examination, Nov/Dec., 2022

Degree	B. Tech.	Program	CSE (Data Science)	Academic Year	2022 - 2023
Course Code	20DS502	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Big Data				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

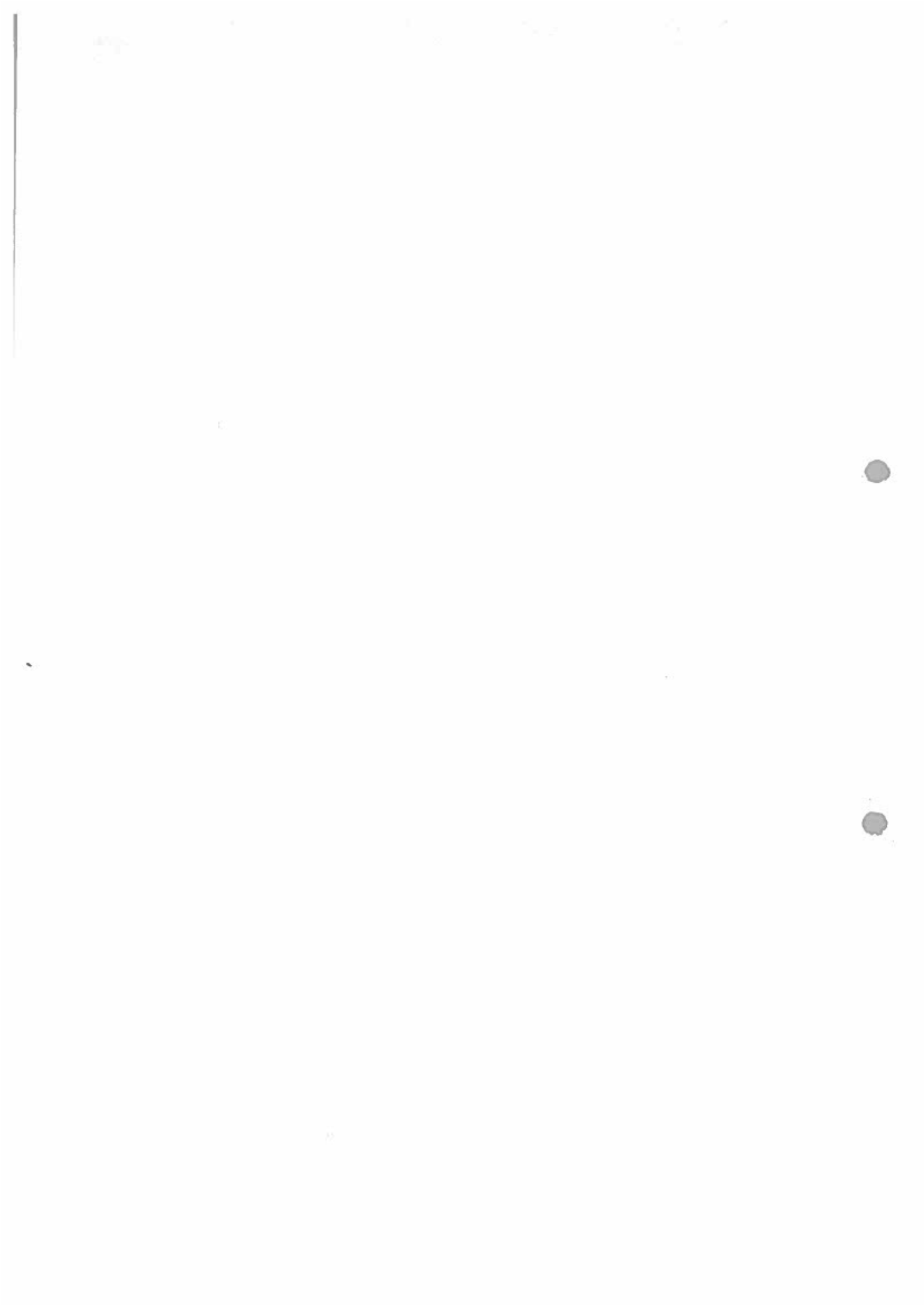
No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List the five characteristics of big data.	20DS502.1	L1
2	List the three HDFS daemons.	20DS502.2	L1
3	Sketch the graphical representation of the spark dataframe.	20DS502.3	L1
4	Mention the two types of Apache Spark RDD operations.	20DS502.4	L1
5	Write the statement to drop database.	20DS502.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate between structure and unstructured data.	5M	20DS502.1	L2
6 (b)	Illustrate the working of various phases of Map Reduce with appropriate example	7M	20DS502.1	L2
OR				
7 (a)	Illustrate Hadoop architecture and its components with a neat diagram.	7M	20DS502.1	L2
7 (b)	Discuss a few benefits of Big Data.	5M	20DS502.1	L2
8 (a)	Summarize the steps to write data into HDFS.	8M	20DS502.2	L2
8 (b)	Compare pseudo-distributed and fully distributed modes.	4M	20DS502.2	L2
OR				
9 (a)	Discuss the concept of Hadoop clusters.	5M	20DS502.2	L2
9 (b)	How will you configure XML files in Hadoop?	7M	20DS502.2	L2
10 (a)	Specify the Fundamental role of the dataframe.	5M	20DS502.3	L2
10 (b)	Illustrate the architecture of spark with a neat diagram.	7M	20DS502.3	L2
OR				
11 (a)	Explicate how spark streaming can be used to stream live data and process the Stock Market data.	7M	20DS502.3	L2
11 (b)	Explain the process of reading a file from a local directory into DataFrame, and applying transformations before the DataFrame is written back to CSV file.	5M	20DS502.3	L2
12 (a)	Explain RDD Lineage with an example.	4M	20DS502.4	L2
12 (b)	List any ten spark pair RDD transformation functions along with its description.	8M	20DS502.4	L2
OR				
13 (a)	Illustrate spark runtime architecture with a neat diagram.	8M	20DS502.4	L2
13 (b)	Discuss the behavior of spark streaming applications in the event of failures.	4M	20DS502.4	L2
14 (a)	Illustrate the Hive architecture with a neat diagram.	7M	20DS502.5	L2
14 (b)	Explain the hive partitioned table with an example.	5M	20DS502.5	L2
OR				
15(a)	Illustrate the components used in Hive Query Processor with an example.	5M	20DS502.5	L2
15 (b)	Explain the table properties that can be altered with ALTER TABLE statement.	7M	20DS502.5	L2

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Degree	B. Tech.	Program	Civil Engineering	Academic Year	2022 – 2023
Course Code	20CE503	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Foundation Engineering				

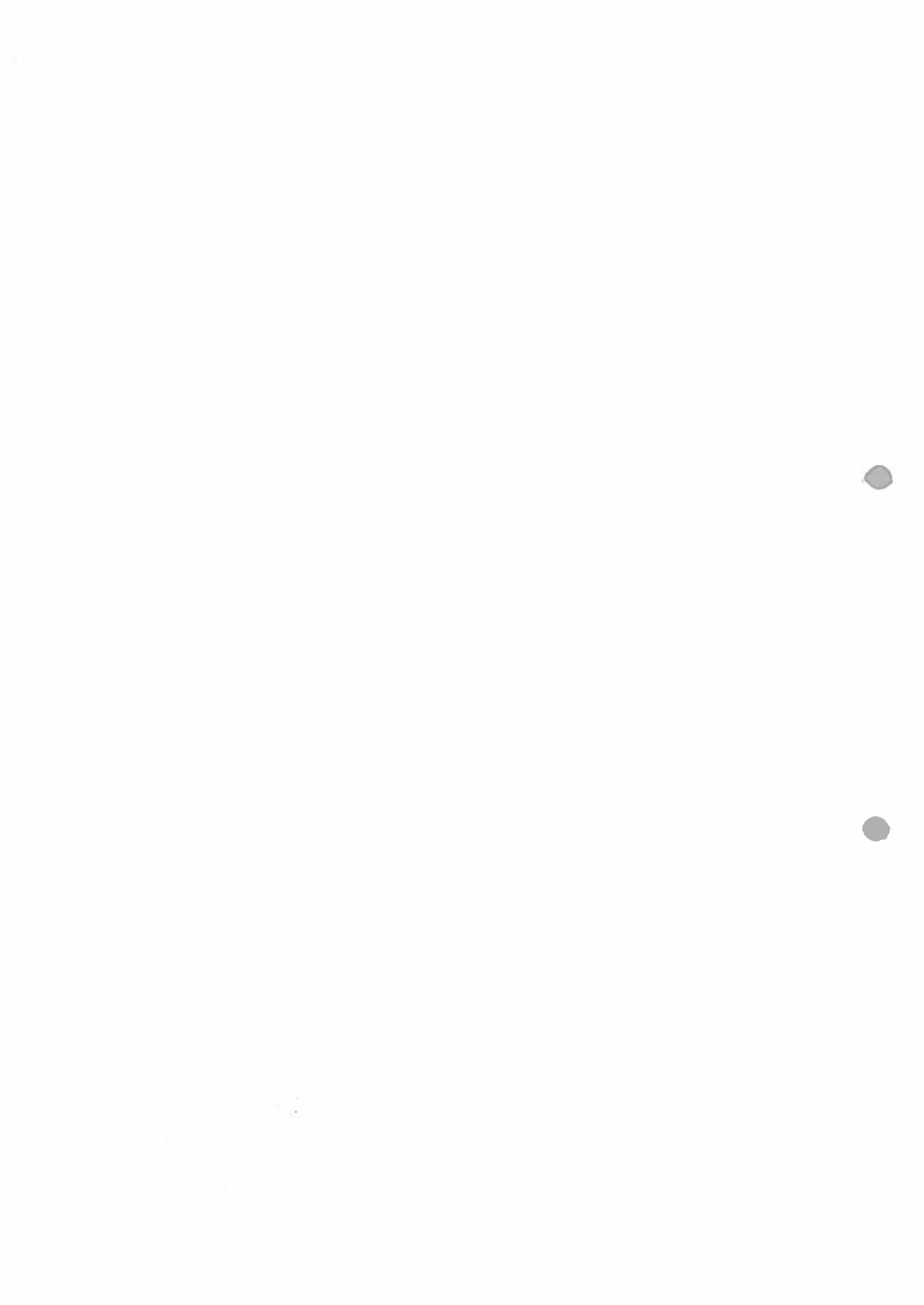
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Give the purpose of subsurface exploration	20CE503.1	L1
2	What is shallow foundation?	20CE503.2	L1
3	List the types of slope failures	20CE503.3	L1
4	What do you mean by sinking of wells?	20CE503.4	L1
5	List the types of lateral earth pressures	20CE503.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Describe the procedure of conducting a plate load test with the help of a neat sketch	12 M	20CE503.1	L2
OR				
7	Explain in detail about preparation of soil investigation report	12M	20CE503.1	L2
8	Explain Terzaghi's analysis of bearing capacity of soil in general shear failure with assumptions	12M	20CE503.2	L2
OR				
9	Describe the procedure of conducting a standard penetration test & explain about the correction factors to be applied	12M	20CE503.2	L2
10	Explain in detail about Swedish circle method of Stability analysis of finite slopes with the help of neat sketch	12M	20CE503.3	L2
OR				
11	Explain in detail about standard method of slices for Stability analysis of finite slopes with the help of neat sketch	12M	20CE503.3	L2
12	What are the precautions to be taken during sinking of wells? How are tilts and shifts of wells rectified?	12M	20CE503.4	L2
OR				
13 (a)	What are different forces to be considered in analysis of well foundation in different shapes of well	6M	20CE503.4	L2
13 (b)	Classify various components of well foundation with the help sketch	6M	20CE503.4	L2
14	A retaining wall is 4 metres high. Its back is vertical and it has got sandy backfill up to its top. The top of the fill is horizontal and carries a uniform surcharge of 85 kN/m ² . Dry density of soil = 18.5 KN/m ³ . Moisture content of soil above water table = 12%. Angle of internal friction of soil = 30°, specific gravity of soil particles = 2.65. Porosity of backfill = 30%. The wall friction may be neglected. Determine (i) Passive pressure acting on the wall (ii) Active pressure acting on the wall	12M	20CE503.5	L3
OR				
15	Explain Rankine's Active earth pressure theory for cohesion less soil and cohesive soil	12M	20CE503.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	Mechanical Engineering	Academic Year	2022 - 2023
Course Code	20ME503	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Metal Cutting and Machine Tools				

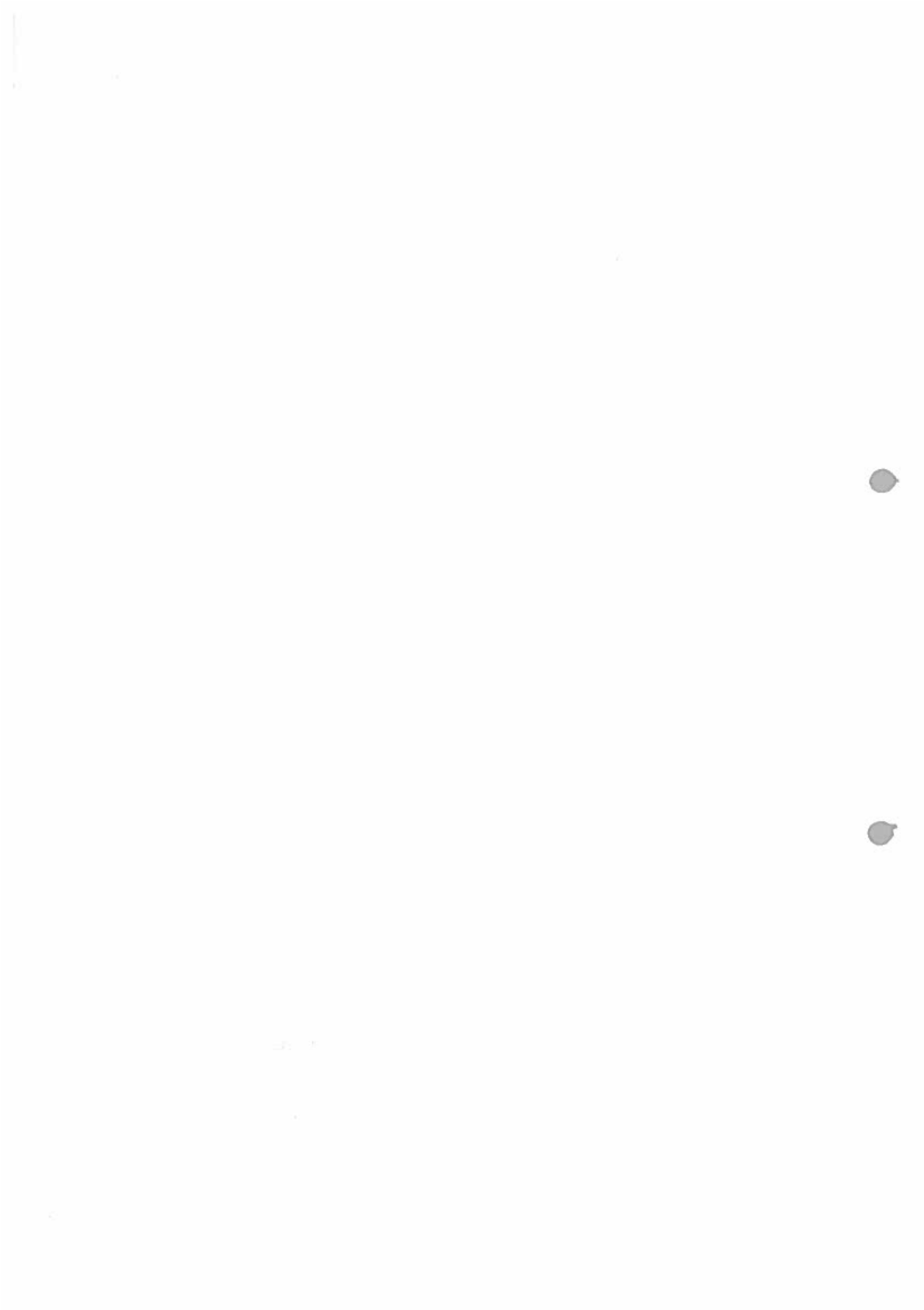
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four essential characteristics of cutting fluids	20ME503.1	L1
2	State the working principle of Automatic lathe	20ME503.2	L1
3	List any three operations performed on planner	20ME503.3	L1
4	What are the types of milling machines?	20ME503.4	L1
5	List any two types of abrasives used in grinding wheel	20ME503.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain single point cutting tool geometry with a neat diagram	6M	20ME503.1	L2
6 (b)	Draw Merchants circle and derive the expression to show the relation among the cutting forces involved in metal cutting	6M	20ME503.1	L2
OR				
7 (a)	Explain the various types of chips	4M	20ME503.1	L2
7 (b)	Give two examples of orthogonal cutting and explain with neat sketch	8M	20ME503.1	L2
8	Explain working principle of Lathe machine with neat sketch	12M	20ME503.2	L2
OR				
9 (a)	Explain any three types of operations performed on lathe machine	6M	20ME503.2	L2
9 (b)	Outline the specifications and working principle of Lathe	6M	20ME503.2	L2
10	Differentiate Planner, Shaper and Slotter	12M	20ME503.3	L2
OR				
11 (a)	Describe any three operations performed on shaper	6M	20ME503.3	L2
11 (b)	Explain the principal parts and specifications of shaping machine	6M	20ME503.3	L2
12	Explain the working principle of vertical milling machines with neat sketch	12M	20ME503.4	L2
OR				
13 (a)	Describe any three operations performed on milling machine with a neat sketch	6M	20ME503.4	L2
13 (b)	Label the specifications and working principle of milling machine	6M	20ME503.4	L1
14	Illustrate briefly about Centre less Grinding Machine and its methods with neat sketch	6M	20ME503.5	L2
OR				
15 (a)	Classify NC machine tools	6M	20ME503.5	L1
15 (b)	Differentiate between Honing and Lapping	6M	20ME503.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech. (U. G.)	Program	EEE	Academic Year	2022-2023
Course Code	20EC305	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Digital System Design				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is the significance of BCD code?	20EC305.1	L1
2	Give the truth table for half adder.	20EC305.2	L1
3	What is ring counter?	20EC305.3	L1
4	What is race around condition?	20EC305.4	L1
5	Write the structure flow of VHDL.	20EC305.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Represent the decimal number 3452 in i)BCD ii)Excess-3	8M	20EC305.1	L2
6 (b)	Convert the following numbers i) $(615)_{10} = ()_{16}$ ii) $(658.825)_{10} = ()_8$	4M	20EC305.1	L2
OR				
7 (a)	Perform the Excess- 3 Subtraction for 87 & 32.	6M	20EC305.1	L2
7 (b)	Perform the BCD Subtraction for 798 & 389.	6M	20EC305.1	L2
8 (a)	Given the Boolean function $Y(A,B,C,D) = A + B C + ABD' + ABCD$. Convert to standard SOP.	6M	20EE405.2	L2
8 (b)	Find the reduced POS form using K-map $F(A,B,C,D) = \pi M(0,6,7,8,12,13,14,15)$. Implement using NOR gates.	6M	20EE405.2	L2
OR				
9 (a)	Convert to Canonical forms (i) $F(X,Y,Z) = X Y + Z$ (ii) $F_2(X, Y, Z) = (X + Y)(X + Z)$.	6M	20EC305.2	L3
9 (b)	Using K map, simplify the following expression and implement using NAND gates $F_1(A, B, C, D) = \sum m(1, 5, 6, 7, 11, 12, 13) + \sum d(10, 15)$.	6M	20EC305.2	L3
10 (a)	Implement the function using only one 4: 1 mux and gates. $F(A, B, C, D) = \sum m(0, 2, 3, 6, 8, 9, 11, 13)$.	6M	20EC305.3	L2
10 (b)	Explain the working of the priority encoder and draw the diagram.	6M	20EC305.3	L2
OR				
11 (a)	Implement the following functions using PLA having 3 i/ps, 4 product terms and 2 outputs. $F_1(A, B, C) = \sum m(3,5,6,7)$ $F_2(A, B, C) = \sum m(0,2,4,7)$.	6M	20EE405.3	L3
11 (b)	Draw the basic structures of PAL and PLA.	6M	20EE405.3	L2
12 (a)	State the excitation table of JK Flip Flop.	4M	20EE405.4	L2
12 (b)	Design a binary counter using T flip flops to count in the following sequence: (i) 000, 001, 010, 011, 100, 101, 111, 000	8M	20EE405.4	L2
OR				
13 (a)	Implement T flip flop using D flip flop.	6M	20EE405.4	L2
13 (b)	Design a synchronous counter that counts the sequence 000,001,010,011,100,101,110,111,000 Using D flip flop.	6M	20EE405.4	L2

14 (a)	Design 2-bit magnitude comparator and write a verilog HDL code.	8M	20EE405.5	L2
14 (b)	Define logic synthesis and simulation.	4M	20EE405.5	L2
OR				
15 (a)	Explain VHDL programming using structural modeling.	6M	20EE405.5	L2
15 (b)	Write the IC design flow of VHDL.	6M	20EE405.5	L2

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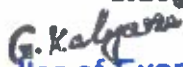
Degree	B. Tech.	Program	ECE	Academic Year	2022 - 2023
Course Code	20EC503	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Antennas & Wave Propagation				

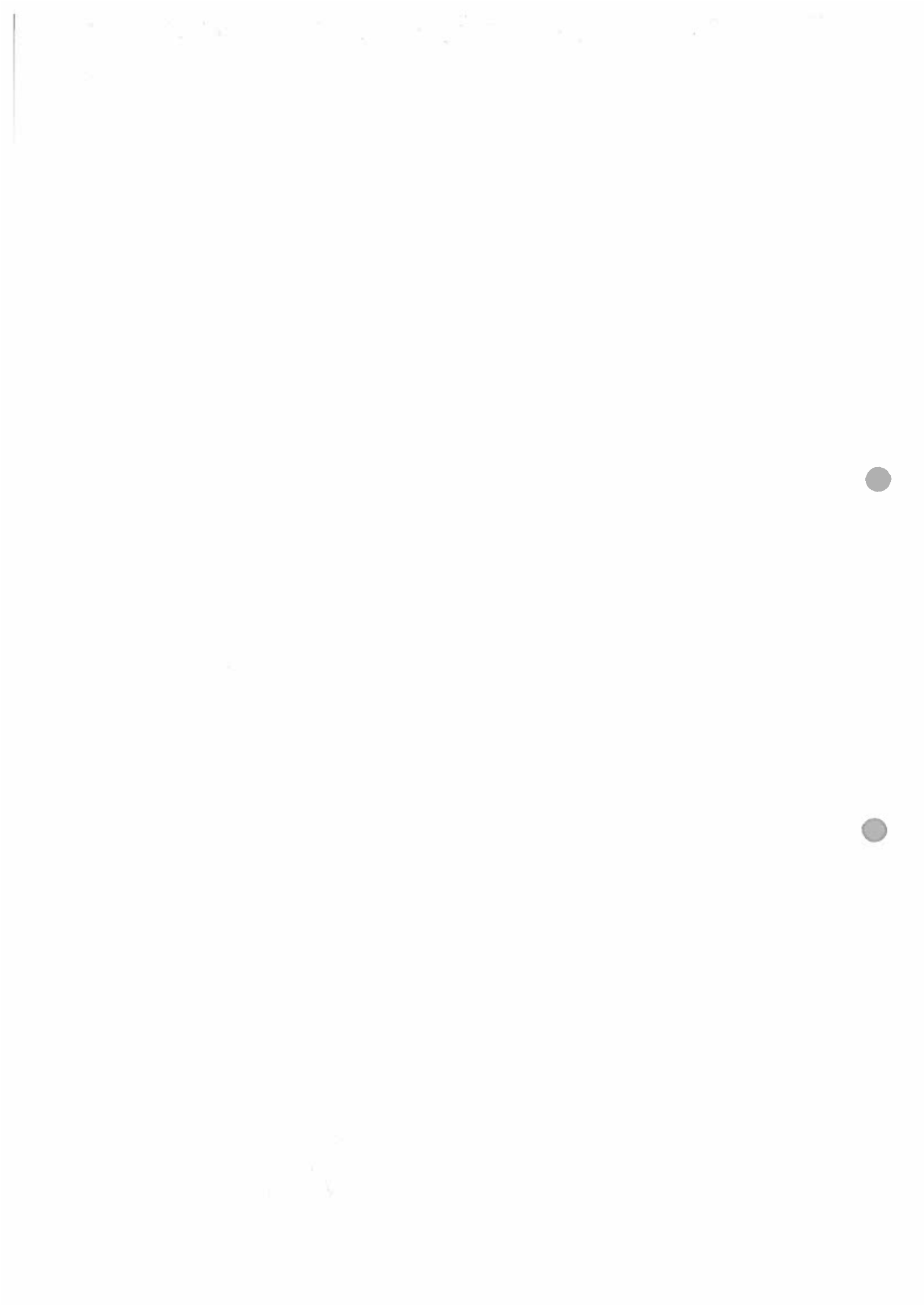
Part A (Short Answer Questions 5 x 2 = 10 Marks)

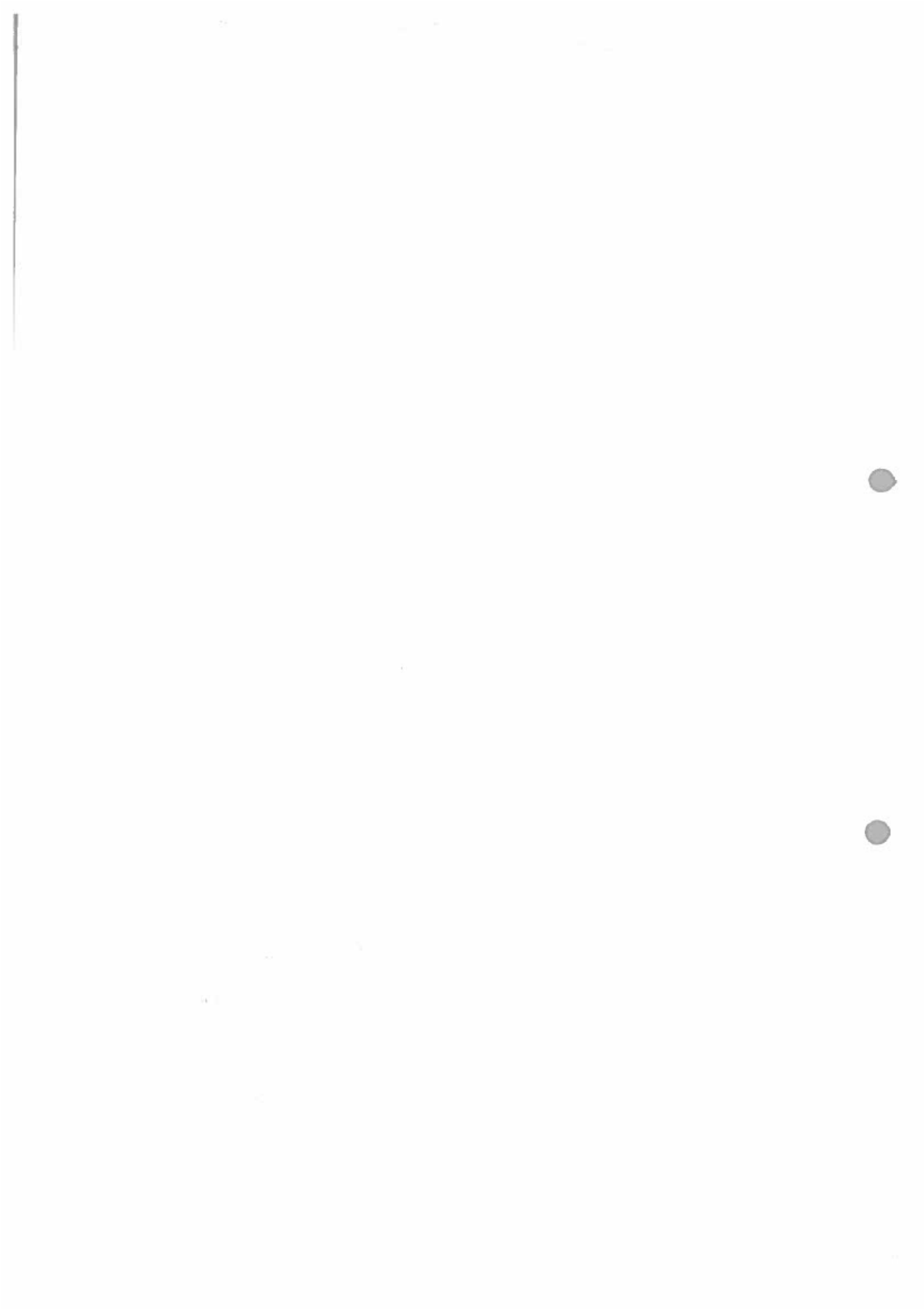
No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Radiation Pattern	20EC503.1	L1
2	Define Radiation Resistance of An Antenna	20EC503.2	L1
3	What are the applications of spiral antenna?	20EC503.3	L1
4	What is Concept of adaptive beam forming?	20EC503.4	L1
5	Define Virtual Height and Fading	20EC503.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Explain the following terms with proper expressions i) Directivity ii) Field pattern ii) Half power beam width iv) Beam efficiency v) Radiation Intensity vi) Polarization	12M	20EC503.1	L2
OR				
7 (a)	Derive Friss transmission equation	6M	20EC503.1	L3
7 (b)	Derive the relationship between directivity and effective area	6M	20EC503.1	L3
8	Derive the field components and radiation resistance of a half wave dipole antenna.	12M	20EC503.2	L3
OR				
9 (a)	Explain in detail about Broadside and End-fire arrays	6M	20EC503.2	L2
9 (b)	Explain the Operating Principle of Yagi -Uda Antenna	6M	20EC503.2	L2
10 (a)	Explain the Design and construction of Helical Antenna	6M	20EC503.3	L2
10 (b)	Discuss the design considerations of Pyramidal Horn Antenna	6M	20EC503.3	L2
OR				
11 (a)	Explain about construction of Spiral Antenna	6M	20EC503.3	L2
11 (b)	What are different types of feed mechanism used in parabolic reflector antenna?	6M	20EC503.3	L2
12 (a)	Explain the principle of Lens antenna	7M	20EC503.4	L2
12 (b)	Explain about different types of smart antennas.	5M	20EC503.4	L2
OR				
13 (a)	Explain the measurement of gain of an antenna	7M	20EC503.4	L2
13 (b)	Explain about microstrip antenna	5M	20EC503.4	L2
14	Derive the Refractive Index of an ionosphere layer in Sky Wave Propagation	12M	20EC503.5	L3
OR				
15 (a)	Explain in detail about Ground Wave Propagation	6M	20EC503.5	L2
15 (b)	Explain the following terms: (i) Critical Frequency (ii) Skip Distance (iii) Virtual Height	6M	20EC503.5	L2


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Semester End Regular Examination, Nov./Dec., 2022


Degree	B. Tech.	Program	CSE (AI & ML)	Academic Year	2022 - 2023
Course Code	20AI503	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	High Performance Computing				

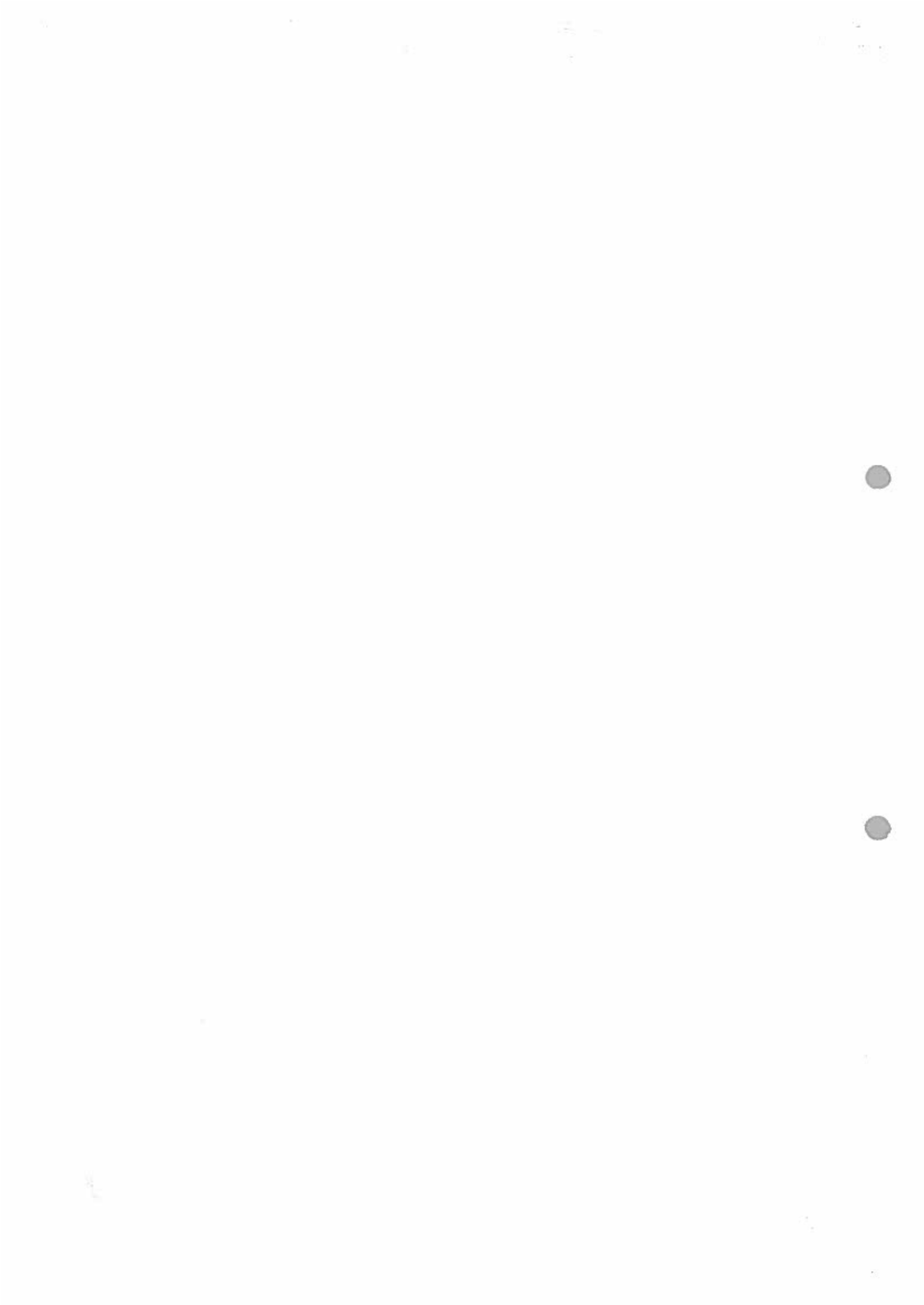
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two advantages and limitations of CUDA.	20AI503.1	L1
2	When multiple GPUs are preferred?	20AI503.2	L1
3	List any four benefits of Open CL.	20AI503.3	L1
4	List any four applications of Parallel Computing.	20AI503.4	L1
5	What is heterogeneous cluster computing?	20AI503.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain CUDA architecture with a neat diagram.	6M	20AI503.1	L2
6 (b)	Explain three parallel architecture schemes.	6M	20AI503.1	L2
OR				
7	Define GPU. Explain architecture of GPU.	12M	20AI503.1	L2
8 (a)	What are the libraries and software components in CUDA 8.0?	8M	20AI503.2	L1
8 (b)	What are the advantages of CUDA over traditional general-purpose computation on GPUs?	4M	20AI503.2	L2
OR				
9	List any five applications of CUDA.	12M	20AI503.2	L2
10 (a)	Why synchronization is important? Describe about implicit and explicit synchronization.	8M	20AI503.3	L2
10 (b)	Explain parallel programming techniques.	4M	20AI503.3	L2
OR				
11 (a)	What is Wait protocol for synchronization? Compare Busy-wait and Sleep-wait protocols.	8M	20AI503.3	L2
11 (b)	Describe Error Handling in CUDA.	4M	20AI503.3	L2
12	Explain the concept of Host Device Interaction.	12M	20AI503.4	L2
OR				
13 (a)	Describe memory consistency models in detail.	6M	20AI503.4	L2
13 (b)	What are the Pit falls of OpenCL applications?	6M	20AI503.4	L2
14 (a)	Write a "Hello World" program in open MPI.	8M	20AI503.5	L2
14 (b)	Differentiate MPI and Open MPI.	4M	20AI503.5	L2
OR				
15	Explain prefix sum matrix multiplication algorithm with example.	12M	20AI503.5	L2


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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	CSE (DS)	Academic Year	2022 – 2023
Course Code	20AI603	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Machine Learning				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List out any four applications of machine learning.	20AI603.1	L1
2	What is a Decision Tree?	20AI603.2	L1
3	Define a Dendrogram.	20AI603.3	L1
4	Explain Posteriori Probability.	20AI603.4	L2
5	Define Reinforcement Learning.	20AI603.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate in between Classification and Regression.	6M	20AI603.1	L2
6 (b)	Explain about binary classification.	6M	20AI603.1	L2

OR

7 (a)	How to classify the data with multiple class labels? Explain in detail	6M	20AI603.1	L2
7 (b)	With example explain how the Concept Learning task determines the Hypothesis for given target concept.	6M	20AI603.1	L2

8 (a)	Explain about decision tree based learning? How it is represented. Give some problems for which decision tree learning is appropriate.	6M	20AI603.2	L2
8 (b)	Discuss in detail about Learning Ordered Rule Lists.	6M	20AI603.2	L2

OR

9 (a)	Explain Tree Learning as variance reduction.	6M	20AI603.2	L2
9 (b)	Describe in detail about descriptive rule learning.	6M	20AI603.2	L2

10 (a)	Describe the procedure used by Least Square Methods for predicting the target classes.	6M	20AI603.3	L2
10 (b)	Explain about nearest neighbor classification.	6M	20AI603.3	L3

OR

11 (a)	Explain SVM Algorithm and its Kernel methods.	6M	20AI603.3	L2
11 (b)	Explain hierarchical clustering with an example.	6M	20AI603.3	L2

12 (a)	Demonstrate Normal or Gaussian distribution with an example.	6M	20AI603.4	L2
12 (b)	Explain how Discriminative Learning is used to perform pattern classification.	6M	20AI603.4	L2

OR

13 (a)	Explain Naïve Bayes Classifier with an example.	6M	20AI603.4	L2
13 (b)	Demonstrate in detail about Compression based models.	6M	20AI603.4	L2

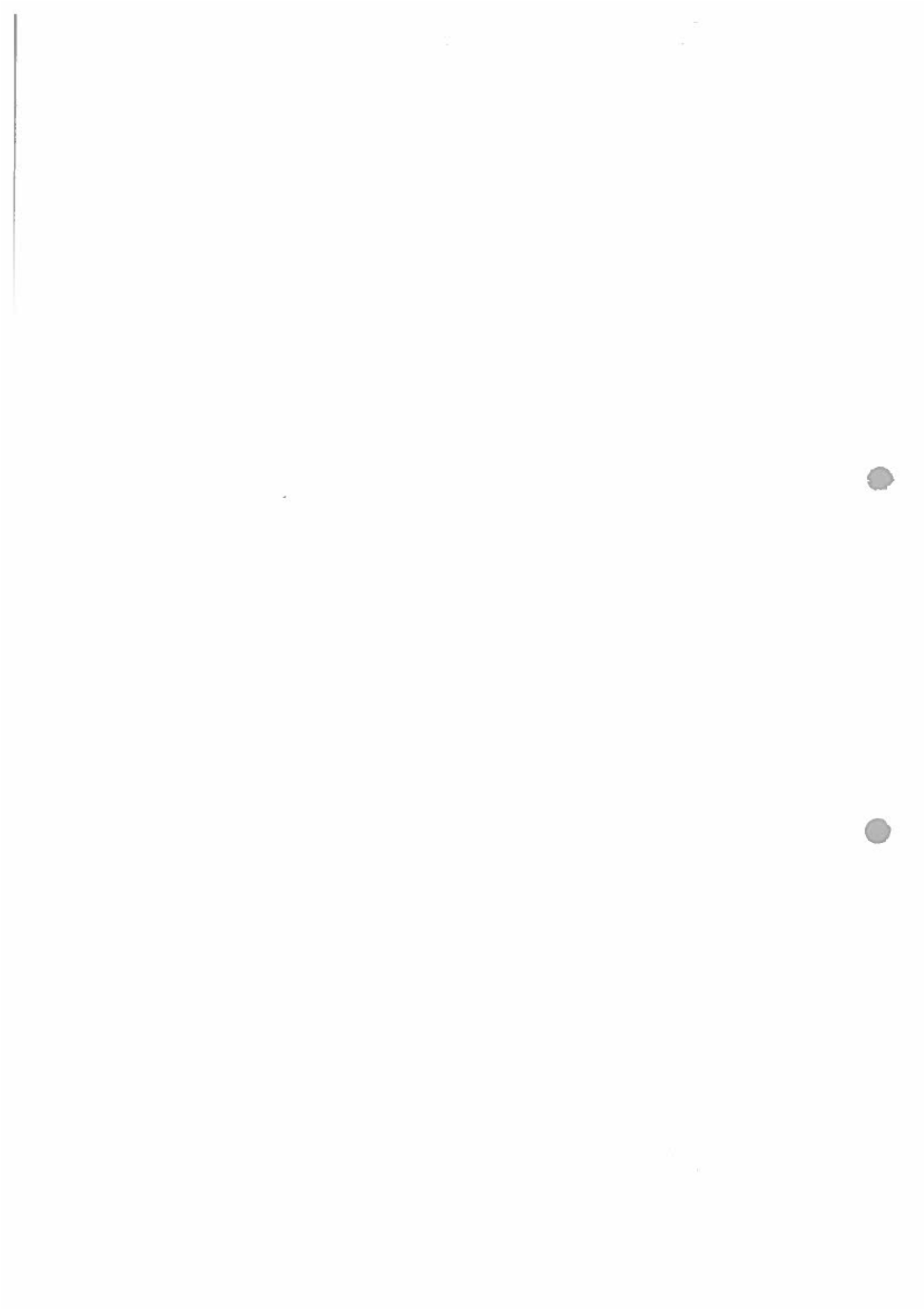
14 (a)	Define Q learning? Explain with an example about Q-learning.	6M	20AI603.5	L2
14 (b)	Describe the random forest algorithm to improve classifier accuracy.	6M	20AI603.5	L2

OR

15 (a)	Compare and Contrast Bagging and Boosting ensemble techniques.	6M	20AI603.5	L2
15 (b)	Explain in detail the main components of reinforcement learning. Is RNN reinforcement learning algorithm	6M	20AI603.5	L2

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Degree	B. Tech.	Program	Civil Engineering			Academic Year	2022 - 2023
Course Code	20CE005	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Construction Equipment Automation						

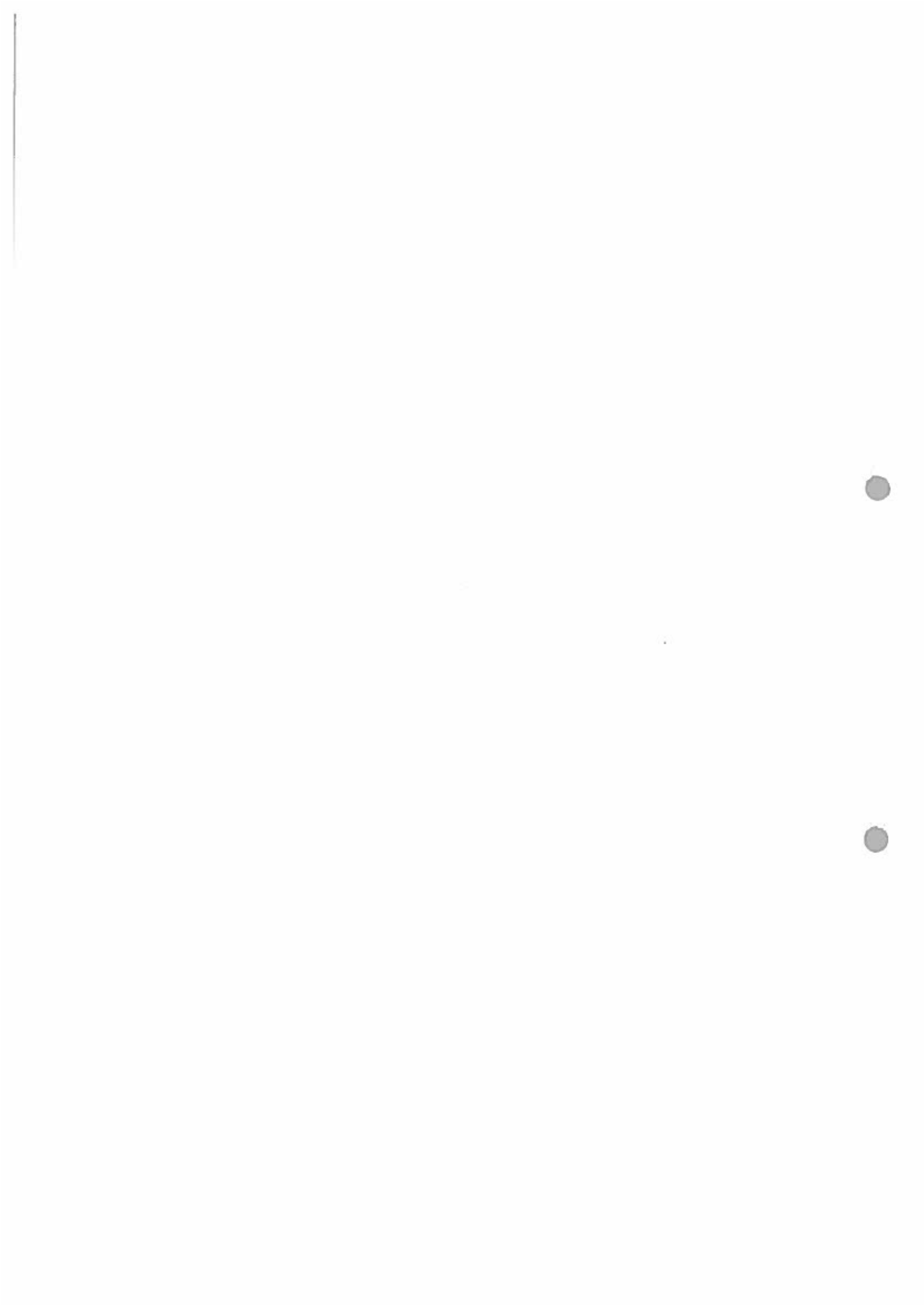
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What are the unique features of construction equipment?	20CE005.1	L1
2	What is the need of construction management?	20CE005.2	L1
3	List any four selection factors for rear dump trucks.	20CE005.3	L1
4	List any two advantages of automation in concrete technology.	20CE005.4	L1
5	List any two benefits of robots in construction industry.	20CE005.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Classify the construction equipments on different basis with suitable examples.	12 M	20CE005.1	L2
OR				
7 (a)	Discuss the applications of grouting equipment.	6M	20CE005.1	L2
7 (b)	Explain about plastering machines in construction industry.	6M	20CE005.1	L2
8 (a)	Discuss objectives of construction management.	6M	20CE005.2	L2
8 (b)	What are the different specifications to be followed while ordering construction equipment?	6M	20CE005.2	L2
OR				
9 (a)	What are the advantages and disadvantages of mechanization in construction?	8M	20CE005.2	L2
9 (b)	Explain about forward planning.	4M	20CE005.2	L2
10 (a)	Explain the steps to be followed while transportation of concrete mix.	6M	20CE005.3	L2
10 (b)	Explain about construction compaction equipment.	6M	20CE005.3	L2
OR				
11	Explain the concrete production steps in ready mix concrete plant.	12M	20CE005.3	L2
12	Explain the adoption of photogrammetry in construction industry with the help of drones.	12M	20CE005.4	L2
OR				
13	Explain about structural health monitoring.	12M	20CE005.4	L2
14	Explain automation in production of steel components.	12M	20CE005.5	L2
OR				
15	List various applications of automation in timber construction.	12M	20CE005.5	L2

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Degree	B. Tech.	Program	Mechanical Engineering	Academic Year	2022 - 2023
Course Code	20ME002	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Unconventional Machining Process				

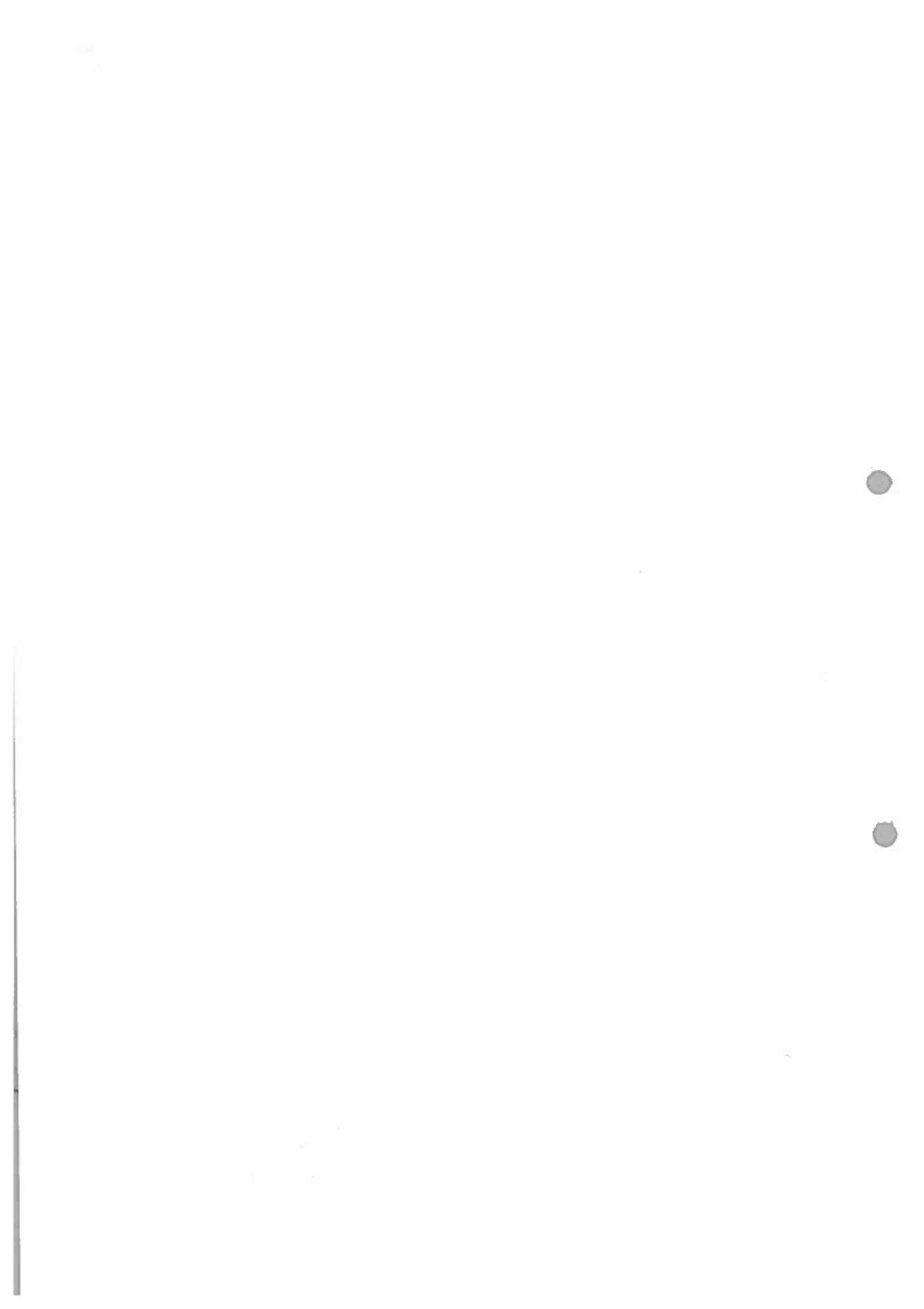
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	State the need for unconventional machining process.	20ME002.1	L1
2	List any two applications of Water Jet Machining.	20ME002.2	L1
3	What are the electrolytes commonly used in ECM?	20ME002.3	L1
4	What the functions of dielectric fluid in EDM process?	20ME002.4	L1
5	Write the various types of torches used in plasma arc machining.	20ME002.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What do you understand by the term unconventional machining methods? What is their importance?	6M	20ME002.1	L1
6 (b)	What is ultrasonic machining? Why is it recommended for brittle materials? What are various tool materials and abrasives used? Compare the abrasives based on cutting ability, life and cost.	6M	20ME002.1	L2
OR				
7	Explain the working principle of USM with a neat sketch.	12M	20ME002.1	L2
8 (a)	Write the factors that affect the performance of water jet machining (WJM) process. Discuss their effects.	6M	20ME002.2	L2
8 (b)	List any four advantages, disadvantages and applications of abrasive water jet machining (AWJM) process.	6M	20ME002.2	L1
OR				
9	Explain the working of an Abrasive Jet Machine with the help of a neat sketch.	12M	20ME002.2	L2
10 (a)	Explain the principle, working and advantages of electro chemical machining process.	6M	20ME002.3	L2
10 (b)	Explain the electrochemical deburring and honing processes.	6M	20ME002.3	L1
OR				
11	Explain the mechanism of material removal during ECG and how is different from ECM	12M	20ME002.3	L2
12 (a)	Explain about R-C circuit used for pulse generation in EDM process.	6M	20ME002.4	L2
12 (b)	Explain the process of wire cut EDM with a neat sketch.	6M	20ME002.4	L2
OR				
13	Explain the effect of different process parameters in EDM.	12M	20ME002.4	L2
14 (a)	Explain the principles and elements of EBM, also how the work table is protected from getting damaged by electron beam.	6M	20ME002.5	L2
14 (b)	Discuss the metal removal mechanism in Laser Beam Machining.	6M	20ME002.5	L2
OR				
15	Explain the principle of plasma generation and mechanism of metal removal in plasma arch machining.	12M	20ME002.5	L2

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Degree	B. Tech.	Program	EEE	Academic Year	2022-2023
Course Code	20EE002	Test Duration	3 Hrs.	Max. Marks	70
Course	Digital Control Systems				
				Semester	V

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four merits of digital control system	20EE002.1	L1
2	Recall primary strips	20EE002.2	L1
3	Define Routh's stability criterion	20EE002.3	L1
4	State the space equation	20EE002.4	L1
5	List any two applications of state feedback controllers	20EE002.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain successive approximation type (Sample and Hold circuit) analog to digital converters with neat schematic diagram	8M	20EE002.1	L2
6 (b)	Explain digital control systems with an example	4M	20EE002.1	L2
OR				
7	Explain sampling theorem with neat diagram	12M	20EE002.1	L2
8	Find the inverse z transform of $zZ^3 + Z / (z - 2)^2(z-1)$	12M	20EE002.2	L3
OR				
9	Explain the Z transform method for solving difference equations	12M	20EE002.2	L2
10 (a)	Determine the stability of the system using Jury's stability test for the characteristic equation $P(Z) = Z^4 - 1.2Z^3 + 0.07Z^2 - 0.08 = 0$	8M	20EE002.3	L3
10 (b)	Write short note on the stability analysis of digital control system using Routh Hurwitz criterion	4M	20EE002.3	L2
OR				
11 (a)	Explain the mapping between the S-Plane and Z-Plane	8M	20EE002.3	L2
11 (b)	Explain about complimentary strips	4M	20EE002.3	L2
12	Given the pulse-transfer function, determine whether the system is completely state controllable and state observable. $\frac{Y(z)}{U(z)} = \frac{z^{-1}(1 - 0.8z^{-1})}{1 + 1.3z^{-1} + 0.4z^{-2}}$	12M	20EE002.4	L3
OR				
13 (a)	Discuss controllability and observability with an example using a 3X3 matrix	6M	20EE002.4	L3
13 (b)	Compare the stability analysis of discrete control system using (i) Routh stability criteria (ii) Jury's Stability criteria	6M	20EE002.4	L2
14 (a)	Explain the concept of state feedback controllers	4M	20EE002.5	L2
14 (b)	State and prove the necessary and sufficient condition for arbitrary pole-placement	8M	20EE002.5	L2

OR

Consider the system $x(k+1) = Gx(k) + Hu(k)$

$$G = \begin{bmatrix} 0 & 1 \\ -0.16 & -1 \end{bmatrix}, H = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

15

12M

20EE002.5

L3

Determine a suitable state feedback gain matrix 'k' such that the system will have the closed loop poles at

$$Z = 0.5 \pm j0.5$$

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Degree	B. Tech.	Program	ECE	Academic Year	2022 - 2023
Course Code	20EC006	Test Duration	3 Hrs.	Max. Marks	70
Course	Electronic Measurements & Instrumentation		Semester	V	

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define precision	20EC006.1	L1
2	List any four applications of Spectrum Analyzer	20EC006.2	L1
3	Mention any two difference between general CRO and special purpose CRO	20EC006.3	L1
4	Write any four applications of bridges	20EC006.4	L1
5	Differentiate active and passive transducers	20EC006.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Classify and explain thermo-couple type ammeters	6M	20EC006.1	L2
6 (b)	Describe the operation of shunt type ohmmeter	6M	20EC006.1	L2
OR				
7 (a)	Define fidelity, lag and resolution	6M	20EC006.1	L2
7 (b)	Describe the operation of series type ohmmeter	6M	20EC006.1	L2
8 (a)	Describe the working of AF sine and square wave generator	6M	20EC006.2	L2
8 (b)	Explain the working of function generator with a neat block diagram	6M	20EC006.2	L2
OR				
9 (a)	Explain working of harmonic distortion analyzer with neat sketch	6M	20EC006.2	L2
9 (b)	Explain the working of RF Spectrum Analyzer with neat block diagram	6M	20EC006.2	L2
10 (a)	Explain the operation of vertical amplifier section	6M	20EC006.3	L2
10 (b)	Draw the block diagram of Sampling oscilloscope and explain its working	6M	20EC006.3	L2
OR				
11 (a)	Discuss horizontal deflection system	4M	20EC006.3	L2
11 (b)	Explain storage oscilloscope with neat sketch	8M	20EC006.3	L2
12 (a)	Derive the expression for unknown inductance using Maxwell Bridge	6M	20EC006.4	L3
12 (b)	Explain the working principle of schering bridge with necessary equations	6M	20EC006.4	L2
OR				
13 (a)	Explain Q meter	6M	20EC006.4	L2
13 (b)	Derive the equation for unknown resistance using wheat stone bridge	6M	20EC006.4	L3

14 (a)	Discuss semi-conductor type strain gauge	3M	20EC006.5	L2
14 (b)	Explain the principle, working, construction, characteristics and applications of LVDTs	9M	20EC006.5	L2
OR				
Discuss the measurement of physical parameters				
15	i) Force - 2M			
	ii) Pressure (Using resistive pressure transducer) - 4M	12M	20EC006.5	L2
	iii) Velocity (Using moving coil and moving magnet type transducer) - 6M			

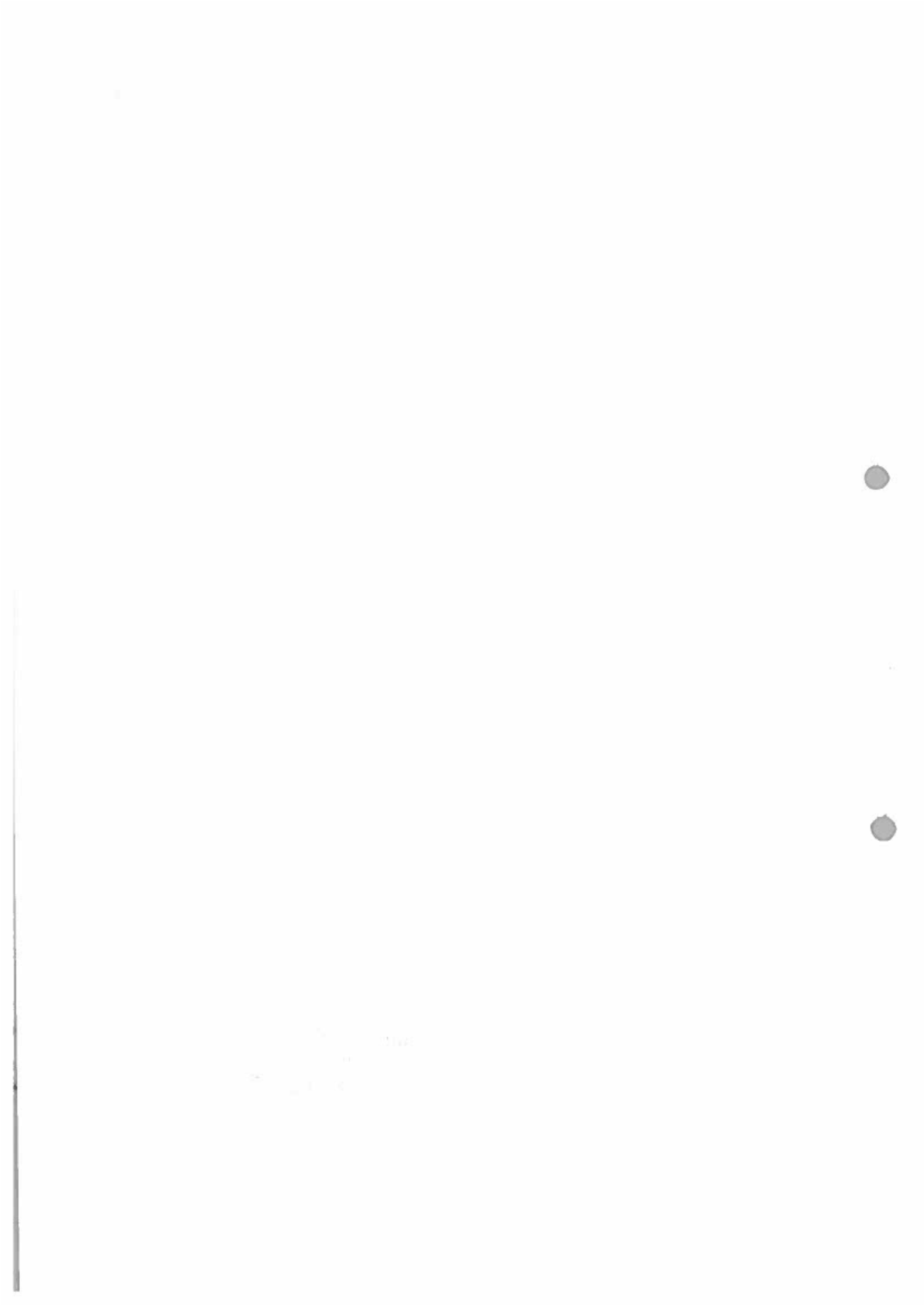
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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	CSE	Academic Year	2022 – 2023
Course Code	20CS001	Test Duration	3 Hrs.	Max. Marks	70
Course	Object Oriented Analysis and Design				
Academic Year	2022 – 2023				
Semester	V				
Part A (Short Answer Questions 5 x 2 = 10 Marks)					
No.	Questions (1 through 5)	Marks	Learning Outcome (s)	DoK	
1	List two methods of analysis and design.		20CS001.1	L1	
2	Compare links and aggregation.		20CS001.2	L2	
3	What is the purpose of state-chart diagram?		20CS001.3	L1	
4	'A system must be loosely coupled and highly cohesive'. Justify.		20CS001.4	L2	
5	What is component?		20CS001.5	L1	
Part B (Long Answer Questions 5 x 12 = 60 Marks)					
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK	
6 (a)	What are the Attributes of Complex Systems? Explain.	6M	20CS001.1	L2	
6 (b)	Explain Designing Complex System.	6M	20CS001.1	L2	
OR					
7 (a)	Explain major elements of object model.	6M	20CS001.1	L2	
7 (b)	What are the benefits and issues in applying object model.	6M	20CS001.1	L1	
8 (a)	Describe the strategies used to identify relationship among the classes.	6M	20CS001.2	L2	
8 (b)	Discuss how to build quality classes and objects.	6M	20CS001.2	L2	
OR					
9 (a)	Explain how you identify Classes and Objects.	6M	20CS001.2	L2	
9 (b)	Discuss Key Abstractions and Mechanisms.	6M	20CS001.2	L2	
10 (a)	What is the importance of modeling and why you need Model?	6M	20CS001.3	L2	
10 (b)	Describe building blocks of the UML.	6M	20CS001.3	L2	
OR					
11 (a)	Discuss the essential Class Relationships.	6M	20CS001.3	L2	
11 (b)	Draw the Class Diagram for Online Shopping Management System.	6M	20CS001.3	L2	
12 (a)	How do you use Interaction diagram when you model dynamic aspects of system. Explain with an example.	6M	20CS001.4	L2	
12 (b)	Draw and explain the activity diagram for an Online Railway Management System.	6M	20CS001.4	L2	
OR					
13 (a)	What is use case? Explain use cases for ATM with a diagram.	6M	20CS001.4	L2	
13 (b)	Difference between collaboration diagram and sequence diagram.	6M	20CS001.4	L2	
14 (a)	What is component diagram? Draw the component diagram for Online Reservation System.	6M	20CS001.5	L2	
14 (b)	Explain deployment diagram.	6M	20CS001.5	L2	
OR					
15 (a)	Draw the deployment diagram for Bank Management System.	6M	20CS001.5	L2	
15 (b)	Draw the Component and Deployment Diagram for ATM system.	6M	20CS001.5	L2	

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Degree	B. Tech.	Program	CSE (AI & ML)			Academic Year	2022 - 2023
Course Code	20AI003	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Cloud Computing Essentials						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four characteristics of cloud computing.	20AI003.1	L1
2	Define Virtualization.	20AI003.2	L1
3	List any four advantages of cloud storage.	20AI003.3	L1
4	List the resource provisioning types.	20AI003.4	L1
5	Define Hadoop.	20AI003.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain Evolution of cloud computing.	6M	20AI003.1	L2
6 (b)	Explain the principles of distributed computing.	6M	20AI003.1	L2
OR				
7 (a)	Explain the principles of parallel computing.	6M	20AI003.1	L2
7 (b)	Explain on demand provisioning in cloud computing.	6M	20AI003.1	L2
8 (a)	Explain the types of virtualization.	5M	20AI003.2	L2
8 (b)	Explain Service Oriented Architecture with neat sketch.	7M	20AI003.2	L2
OR				
9 (a)	Explain virtualization of CPU, Memory and I/O devices.	6M	20AI003.2	L2
9 (b)	What are tools and mechanisms of cloud virtualization?	6M	20AI003.2	L2
10 (a)	Explain NIST cloud computing Reference Architecture.	7M	20AI003.3	L2
10 (b)	List the cloud deployment models and explain any three models.	5M	20AI003.3	L2
OR				
11 (a)	Explain about Layers of cloud computing.	7M	20AI003.3	L2
11 (b)	Explain about storage as a service.	5M	20AI003.3	L2
12 (a)	What is resource provisioning? Explain resource provisioning methods.	5M	20AI003.4	L2
12 (b)	Write short on security governance.	7M	20AI003.4	L2
OR				
13 (a)	Write short note on cloud security challenges	6M	20AI003.4	L2
13 (b)	Explain about virtual machine security	6M	20AI003.4	L2
14 (a)	Explain about Map Reduce.	6M	20AI003.5	L2
14 (b)	Explain the architecture of Google App Engine.	6M	20AI003.5	L2
OR				
15 (a)	Explain Open Nebula and Eucalyptus.	6M	20AI003.5	L2
15 (b)	Describe about four levels of federation.	6M	20AI003.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

Degree	B. Tech.	Program	CSE (DS)	Academic Year	2022 - 2023
Course Code	20CS005	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Mobile Computing				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define GSM.	20CS005.1	L1
2	What is Medium Access Control?	20CS005.2	L1
3	What is the use of DHCP?	20CS005.3	L1
4	How does Client Server Computing work?	20CS005.4	L1
5	Define Protocol.	20CS005.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain mobile communication.	6M	20CS005.1	L2
6 (b)	Discuss the paradigms of Mobile Computing.	6M	20CS005.1	L2
OR				
7 (a)	Explain GSM System Architecture.	6M	20CS005.1	L2
7 (b)	Explain Radio Interface.	6M	20CS005.1	L2
8 (a)	Explain Time Division Multiple Access.	6M	20CS005.2	L2
8 (b)	Explain Hidden and Exposed Terminals.	6M	20CS005.2	L2
OR				
9 (a)	Compare CDMA with FDMA.	6M	20CS005.2	L2
9 (b)	Explain IEEE 802.11.	6M	20CS005.2	L2
10 (a)	Explain Mobile TCP.	6M	20CS005.3	L2
10 (b)	Explain Location Management.	6M	20CS005.3	L2
OR				
11 (a)	Discuss Tunneling and Encapsulation.	6M	20CS005.3	L2
11 (b)	Explain Route Optimization.	6M	20CS005.3	L2
12 (a)	Explain indirect TCP/IP Protocols.	6M	20CS005.4	L2
12 (b)	Explain Snooping Transmission Control Protocol.	6M	20CS005.4	L2
OR				
13 (a)	Explain Database Hoarding & Caching Techniques.	6M	20CS005.4	L2
13 (b)	Discuss the Quality-of-Service issues.	6M	20CS005.4	L2
14	Explain Push, Pull and Hybrid mechanisms.	12M	20CS005.5	L2
OR				
15 (a)	Explain Selective Tuning.	6M	20CS005.5	L2
15 (b)	Discuss Data Synchronization Software.	6M	20CS005.5	L2

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Degree	B. Tech.	Program	Common to All	Academic Year	2022 - 2023
Course Code	20CEO01	Test Duration	3 Hrs. Max. Marks	70	Semester
Course	Urban Environmental Services (Open Elective)				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is the impact of urban planning on health?	20CEO01.1	L1
2	What is urban sprawl and what are the impacts?	20CEO01.2	L1
3	What role does transportation planning play in urban planning?	20CEO01.3	L1
4	Recall the spatial health care access in urban planning.	20CEO01.4	L1
5	What are the factors that influence the collection of preliminary data for urban development?	20CEO01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Elucidate on Health implications of traditional urban planning.	12 M	20CEO01.1	L2
OR				
7	List and explain the factors affecting urban planning and health development.	12M	20CEO01.1	L2
8	Explain the urban sprawl index and interpret the various factors that influence the benefits and drawbacks of urban form.	12M	20CEO01.2	L2
OR				
9	Discuss the renewing of health-urban link in cities.	12M	20CEO01.2	L2
10	List and explain the key environmental impacts caused during the implementation of transportation development during urbanization.	12M	20CEO01.3	L2
OR				
11	Elucidate the various process involved in the system approach concept in urban transport planning and explain its stages.	12M	20CEO01.3	L2
12	Elaborate the five dimensions of access to health care considered in urban health design.	12M	20CEO01.4	L2
OR				
13	List and explain the various factors that influences the transport and infrastructure on the accessibility to the health services	12M	20CEO01.4	L2
14	Explain data collection for the formulation of conceptual framework of urban system.	12M	20CEO01.5	L2
OR				
15	Elaborate the role of various governmental and non-governmental organizations/departments on successful implementation of smart cities with major emphasis on health and economy.	12M	20CEO01.5	L2

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Degree	B. Tech. (U. G.)	Program	Common to All	Academic Year	2022 – 2023
Course Code	20AIO01	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Machine Learning for Engineers (Open Elective)				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define machine learning.	20AIO01.1	L1
2	List out any two applications of Machine Learning.	20AIO01.2	L1
3	Define classification and clustering.	20AIO01.3	L1
4	List any two genetic operators.	20AIO01.4	L1
5	Write Baye's theorem.	20AIO01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain different types of machine learning.	6M	20AIO01.1	L2
6 (b)	Explain about linear regression.	6M	20AIO01.1	L2
OR				
7	Describe about vectors and candidate elimination algorithm.	12M	20AIO01.1	L2
8	Explain multi-layered perceptron model with suitable example.	12M	20AIO01.2	L2
OR				
9	Describe support vector machine algorithm with a suitable example.	12M	20AIO01.2	L2
10	Explain decision tree algorithm with a suitable application.	12M	20AIO01.3	L2
OR				
11	Describe nearest neighbor algorithm with example.	12M	20AIO01.3	L2
12	Explain about principal component analysis and independent component analysis.	12M	20AIO01.4	L2
OR				
13	Explain genetic algorithm along with operators and applications.	12M	20AIO01.4	L2
14	Explain about Monte Carlo methods.	12M	20AIO01.5	L2
OR				
15	Describe Bayesian network.	12M	20AIO01.5	L2


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Degree	B. Tech.	Program	Common to All	Academic Year	2022 - 2023
Course Code	20ECO01	Test Duration	3 Hrs. Max. Marks	Semester	V
Course	Architectures and Algorithms of IoT (Open Elective)				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What are things in IoT terminology?	20ECO01.1	L1
2	What is a protocol?	20ECO01.1	L1
3	Define a Duty Cycle	20ECO01.3	L1
4	What are events in IoT?	20ECO01.2	L1
5	List any two examples of IIoT	20ECO01.2	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 11)	Marks	Learning Outcome (s)	DoK
6	Explain four applications of IoT	12M	20ECO01.1	L2
	OR			
7	Explain the Architecture of IoT	12M	20ECO01.1	L2
8	Explain the protocol concept used in IoT design	12M	20ECO01.2	L2
	OR			
9	Classify and explain the different IoT oriented protocols	12M	20ECO01.2	L2
10	Write short notes with reference to IoT device spacing (a) Data Bases (b) Cost of Ownership (c) Power Consumption	12M	20ECO01.3	L2
	OR			
11	Explain the Cost per Transistor and Chip Size in IoT	12M	20ECO01.3	L2
12	Describe the IoT Event Analysis with an example	12M	20ECO01.4	L2
	OR			
13	Describe the IoT network model with devices, networks and hubs	12M	20ECO01.4	L2
14	Draw and explain Architecture of IIoT	12M	20ECO01.5	L2
	OR			
15	Explain the challenges and applications of IIoT	12M	20ECO01.5	L2

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Degree	B. Tech.	Program	Common to All			Academic Year	2022- 2023
Course Code	20EEO01	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Introduction to Renewable Energy Sources (Open Elective)						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Draw the I-V characteristics of PV cell	20EEO01.1	L1
2	State the wind power equation	20EEO01.2	L1
3	Write any 4 merits and limitations of wave energy	20EEO01.3	L1
4	List out any 4 demerits of Bio-gas plant	20EEO01.4	L1
5	What is the importance of the geothermal energy over the conventional energy sources?	20EEO01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain about the solar radiation spectra.	6M	20EEO01.1	L2
6 (b)	Explain about the working principle of a flat plate collector with a neat sketch.	6M	20EEO01.1	L2
OR				
7 (a)	Explain about the principle of the solar thermal power generation.	6M	20EEO01.1	L2
7 (b)	Explain about any two solar PV applications.	6M	20EEO01.1	L2
8 (a)	Explain about the 2 types of wind energy systems.	6M	20EEO01.2	L2
8 (b)	Explain about any 6 factors affecting the site selection of the wind power plants.	6M	20EEO01.2	L2
OR				
9 (a)	Derive the expression for power in the wind turbine systems.	7M	20EEO01.2	L3
9 (b)	Write a short on wind turbine generators.	5M	20EEO01.2	L1
10 (a)	Explain about the working principle of OTEC with a neat sketch. And list out its demerits.	6M	20EEO01.3	L2
10 (b)	List out any 5 merits and demerits of tidal energy.	6M	20EEO01.3	L1
OR				
11 (a)	Explain about the OTEC closed cycle system with a neat sketch.	6M	20EEO01.3	L2
11 (b)	Write a short note on single basin system.	6M	20EEO01.3	L1
12 (a)	Explain about the principle of bio-conversion systems with a neat sketch.	5M	20EEO01.4	L2
12 (b)	Explain about single stage bio gas digesters along with any 3 advantages and disadvantages.	7M	20EEO01.4	L2
OR				
13 (a)	Explain about the combustion characteristics of bio-gas.	6M	20EEO01.4	L1
13 (b)	Explain about the working principle of I.C engine with a neat sketch.	6M	20EEO01.4	L1
14 (a)	Explain about the basic principle of Geo-thermal energy generation with a neat sketch.	6M	20EEO01.5	L2
14 (b)	Write any 6 merits and demerits of geothermal energy.	6M	20EEO01.5	L2
OR				
15 (a)	Compare between Geothermal power plant and conventional thermal power plant.	6M	20EEO01.5	L2
15 (b)	What is the need of an improved cooking stove (ICS) over conventional cooking stoves in the world? Explain.	6M	20EEO01.5	L1

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Degree	B. Tech.	Program	Common to All		Academic Year	2021 - 2022
Course Code	20DSO01	Test Duration	3 Hrs.	Max. Marks	70	Semester V
Course	Introduction to Database Management Systems (Open Elective)					

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any 4 database applications	20DSO01.1	L1
2	What is an Entity?	20DSO01.2	L1
3	Define the term Data Dictionary.	20DSO01.4	L1
4	How to create table with syntax in SQL?	20DSO01.3	L1
5	Define DROP command with syntax.	20DSO01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain Database and DBMS along with the importance of database design.	6M	20DSO01.1	L2
6 (b)	What are the problems in file system data management? Explain with relevant example.	6M	20DSO01.1	L2
OR				
7	Explain different data models.	12M	20DSO01.1	L2
8 (a)	Discuss correlated nested queries along with a query to find the names of sailors who have reserved a red boat?	6M	20DSO01.2	L2
8 (b)	Explain different types of joins with examples	6M	20DSO01.2	L2
OR				
9 (a)	Explain about ER model.	12M	20DSO01.2	L2
10 (a)	Explain various DML, DDL commands in SQL.	6M	20DSO01.3	L2
10 (b)	Explain Set Operators	6M	20DSO01.3	L2
OR				
11 (a)	Explain Order by, Group by and Having Clauses with example	6M	20DSO01.3	L2
11 (b)	Explain Aggregate functions with examples	6M	20DSO01.3	L2
12 (a)	Explain the components of PL/SQL block.	6M	20AI603.4	L2
12 (b)	Explain about control statements in PL/SQL block	6M	20AI603.4	L2
OR				
13 (a)	Explain about triggers.	6M	20AI603.4	L2
13 (b)	Explain about cursors.	6M	20AI603.4	L2
14	Explain about Normalization and need for normalization along with the problems caused by Redundancy	12M	20AI603.5	L2
OR				
15	Explain Third NF and BCNF with relevant table structure.	12M	20AI603.5	L2

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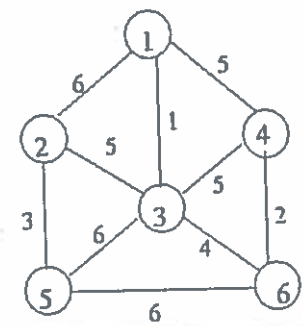
Degree	B. Tech.	Program	Common to All	Academic Year	2022 - 2023
Course Code	20CS001	Test Duration	3 Hrs. Max. Marks	70	Semester V
Course	Data Structures and Algorithms (Open Elective)				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What are the different representations of graphs?	20CS001.2	L1
2	What are the various characteristics of an algorithm?	20CS001.2	L1
3	What are the applications of an array?	20CS002.5	L1
4	Define divide and conquer technique with example.	20CS002.1	L1
5	Define performance analysis of an algorithm.	20CS002.1	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What is an algorithm? Write an algorithm for calculating the average of 5 numbers.	8M	20CS001.1	L2
6 (b)	Explain the Big Oh, Omega and Theta notations.	4M	20CS001.1	L2
OR				
7 (a)	Explain about types of arrays and its representations.	6M	20CS001.1	L2
7 (b)	Explain various operations on data structures.	6M	20CS001.1	L2
8 (a)	Define stack and write an algorithm to implement stack using array.	8M	20CS001.2	L2
8 (b)	Explain the differences between stack and a queue.	4M	20CS001.2	L2
OR				
9 (a)	Explain about Singly linked list operations and write its algorithms.	8M	20CS001.2	L2
9 (b)	List out any 4 applications of linked lists.	4M	20CS001.2	L1
10 (a)	What is a binary tree? Construct a binary tree for given array of elements and write in-order, pre order and post order traversals along with algorithm.	8M	20CS001.3	L2
10 (b)	Explain Binary tree, Full Binary tree, complete binary tree and balanced binary tree with examples.	4M	20CS001.3	L2
OR				
11 (a)	Write an algorithm for construction of DFS. Construct Depth First Search Path from the following.	4M	20CS001.3	L2
11 (b)	<div style="margin-left: 20px;"> <p>Adjacency Lists</p> <p>A : B, D B : C, F C : E, G, H D : E, F E : B, F F : A G : F H : A</p> </div>	8M	20CS001.3	L2
12 (a)	Write an algorithm for Bubble sort.	6M	20CS001.4	L2
12 (b)	Sort the following elements using Bubble sort. 14, 26, 15, 55, 75, 50, 60, 30.	6M	20CS001.4	L2
OR				
13 (a)	Write an algorithm for Merge Sort.	6M	20CS001.4	L2
13 (b)	Search the element 10 from the given list using linear search technique 32, 14, 65, 67, 23, 36, 6, 100.	6M	20CS001.4	L2
14 (a)	Write prim's algorithm for finding minimum spanning tree.	4M	20CS001.5	L2

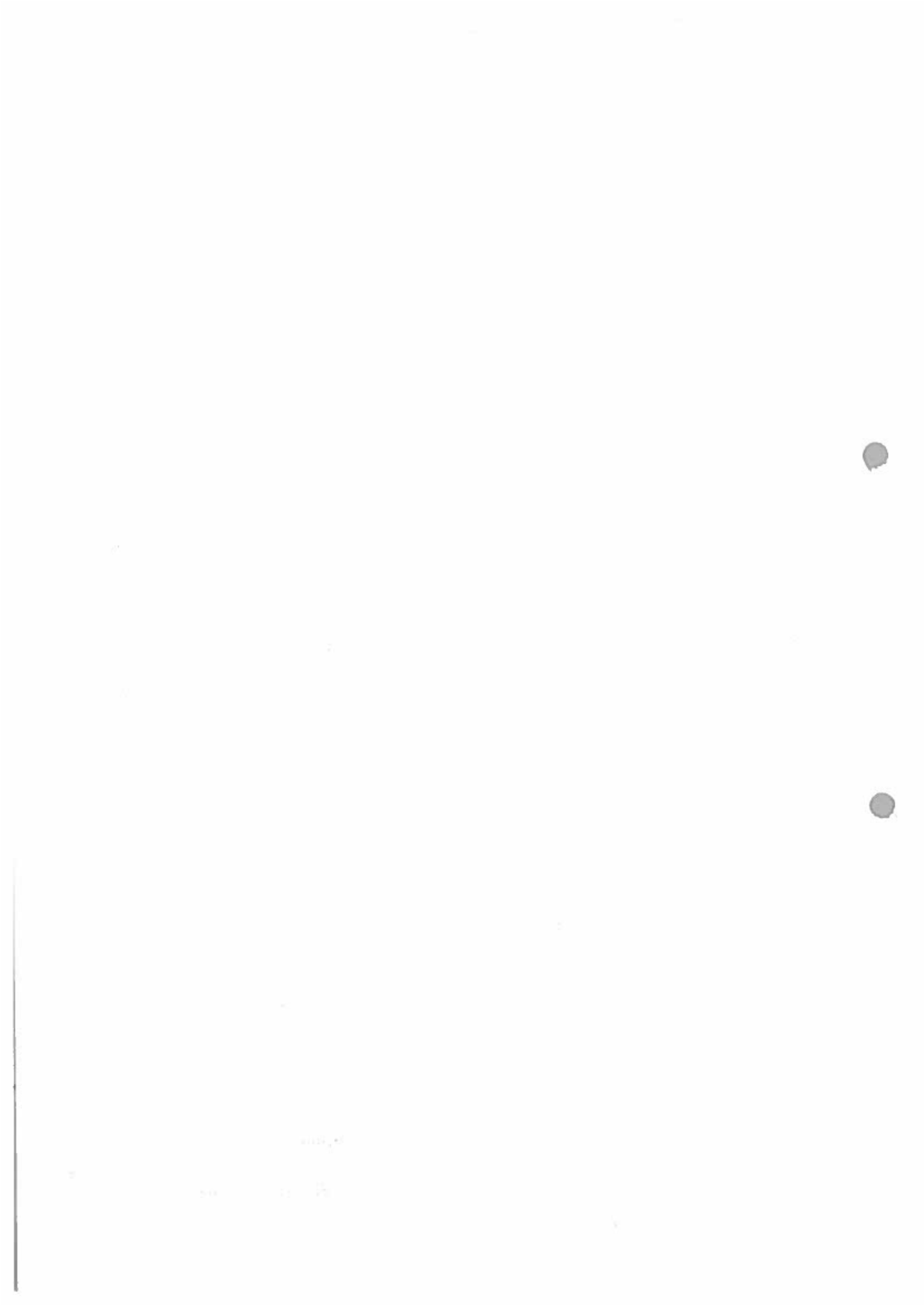
14 (b)	<p>Construct minimum spanning tree using Prim's algorithm from the following graph.</p> 	8M	20CS001.5	L2
OR				
15 (a)	Explain All pairs shortest path algorithm with example.	6M	20CS502.5	L2
15 (b)	<p>Find the optimal solution for the fractional knapsack problem making use of greedy approach. Consider- $n = 5$, $w = 60$ kg $(w_1, w_2, w_3, w_4, w_5) = (5, 10, 15, 22, 25)$ $(b_1, b_2, b_3, b_4, b_5) = (30, 40, 45, 77, 90)$</p>	6M	20CS502.5	L2

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Degree	B. Tech.	Program	Common to All		Academic Year	2022 - 2023
Course Code	20SHO01	Test Duration	3 Hrs.	Max. Marks	70	Semester
Course	Women and Society (Open Elective)					
Part A (Short Answer Questions 5 x 2 = 10 Marks)						
No.	Questions (1 through 5)				Learning Outcome (s)	DoK
1	Write the difference between gender and sex.				20SHO01.2	L1
2	What is socialist Feminism?				20SHO01.1	L1
3	What is Uniform Civil code				20SHO01.2	L1
4	Define gender stereotyping with one example.				20SHO01.4	L1
5	Define the term 'taboo' with one example.				20SHO01.1	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)						
No.	Questions (6 through 15)	Marks			Learning Outcome (s)	DoK
6 (a)	What are the theories of social construction of gender? Explain with relevant examples	6M			20SHO01.1	L2
6 (b)	Write a brief note on the status of women in Independent India.	6M			20SHO01.1	L2
OR						
7 (a)	Gender equality and women empowerment are key to reducing poverty in India. Elucidate.	6M			20SHO01.1	L2
7 (b)	Explain androcentrism.	6M			20SHO01.1	L2
8 (a)	Write a short note on the Socio-Economic Status of women in ancient India.	8M			20SHO01.2	L2
8 (b)	How do stereotypes affect women's right to equality?	4M			20SHO01.2	L2
OR						
9 (a)	What were the issues in Shah Bano Begum case? Explain.	6M			20SHO01.2	L2
9 (b)	Explain in detail the Women's rights movement of 1848-1920 and its significance.	6M			20SHO01.2	L2
10 (a)	Describe gender norms.	6M			20SHO01.3	L2
10 (b)	Explain stereotyping. Why is it important to break gender norms and stereotypes?	4M			20SHO01.3	L2
OR						
11 (a)	What is feminism? Explain the types of feminism with relevant examples.	6M			20SHO01.3	L2
11 (b)	What do you mean by domestic violence? How does domestic violence affect us? Explain.	6M			20SHO01.3	L2
12 (a)	Environment movements often contain economic and identity issues. Discuss.	6M			20SHO01.4	L2
12 (b)	Mention about 19 th century social and religious reform movements.	6M			20SHO01.4	L1
OR						
13 (a)	Mention the measures to ensure the safety and security of women in India.	8M			20SHO01.4	L2
13 (b)	Discuss the prominent psychological theories of gender role and gender identity development.	4M			20SHO01.4	L2
14 (a)	Critically evaluate the representation of women identity in India cinema.	6M			20SHO01.5	L2
14 (b)	Explain with examples the social construct of gender.	6M			20SHO01.5	L2
OR						
15 (a)	Explain the role of media in women's empowerment in Indian society.	6M			20SHO01.5	L2
15 (b)	Explain the role of Role of Women in Panchayat Development and also mention the challenges.	6M			20SHO01.5	L2

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Degree	B. Tech.	Program	Mechanical Engineering		Academic Year	2022 - 2023
Course Code	20MEO01	Test Duration	3 Hrs.	Max. Marks	70	Semester
Course	Nano Technology (Open Elective)					

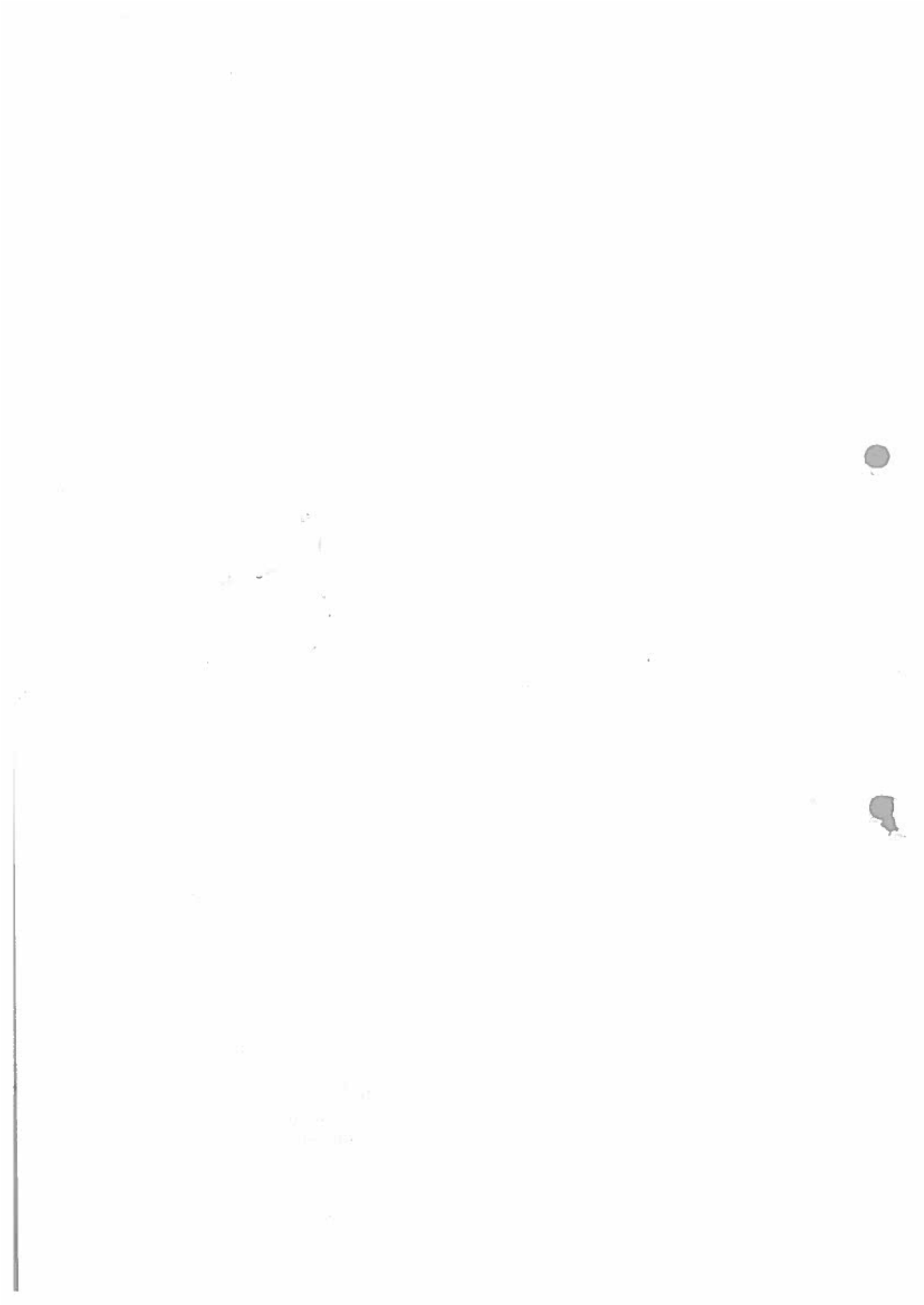
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define the following terms (i) Nano Science (ii) Nano Technology.	20MEO01.1	L1
2	Define Top-down and bottom-up approach.	20MEO01.2	L1
3	Define Nanoforms of Carbon.	20MEO01.3	L1
4	What do you mean by surface analysis technique?	20MEO01.4	L1
5	Define Nano Biotechnology.	20MEO01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the classification of Nanoscale particles.	6M	20MEO01.1	L1
6 (b)	What is Nanometer scale? Explain.	6M	20MEO01.1	L2
OR				
7 (a)	What are the effects of Nano materials on Magnetic and Mechanical properties?	6M	20MEO01.1	L1
7 (b)	What are the implications of Nano science for Physics and Chemistry?	6M	20MEO01.1	L2
8	Explain Ball milling method under Top-down approach with the help of neat sketch.	12M	20MEO01.2	L2
OR				
9 (a)	With the help of neat sketch, explain the Physical Vapour Deposition (PVD) method.	8M	20MEO01.2	L2
9 (b)	Define Lithography.	4M	20MEO01.2	L1
10 (a)	Explain Quantum wires	4M	20MEO01.3	L2
10 (b)	Explain the following (i) Single wall Carbon Nano Tubes (ii) Double wall Carbon Nano Tubes	8M	20MEO01.3	L2
OR				
11	Describe the Buckminster fullerence with the help of neat sketch.	12M	20MEO01.3	L2
12 (a)	With the help of neat sketch, explain Scanning Electron Microscopy (SEM).	6M	20MEO01.4	L2
12 (b)	Explain X-ray diffraction technique.	6M	20MEO01.4	L2
OR				
13	Explain the following (i) Atomic force microscopy (ii) Scanning Tunneling Microscope	12M	20MEO01.4	L2
14	Write a short note on (i) Nano computer (ii) Super chip (iii) Nano crystal	12M	20MEO01.5	L2
OR				
15 (a)	Describe about Micro Electro Mechanical Systems (MEMS).	6M	20MEO01.5	L2
15 (b)	Explain the applications of nanotechnology in medicine.	6M	20MEO01.5	L2


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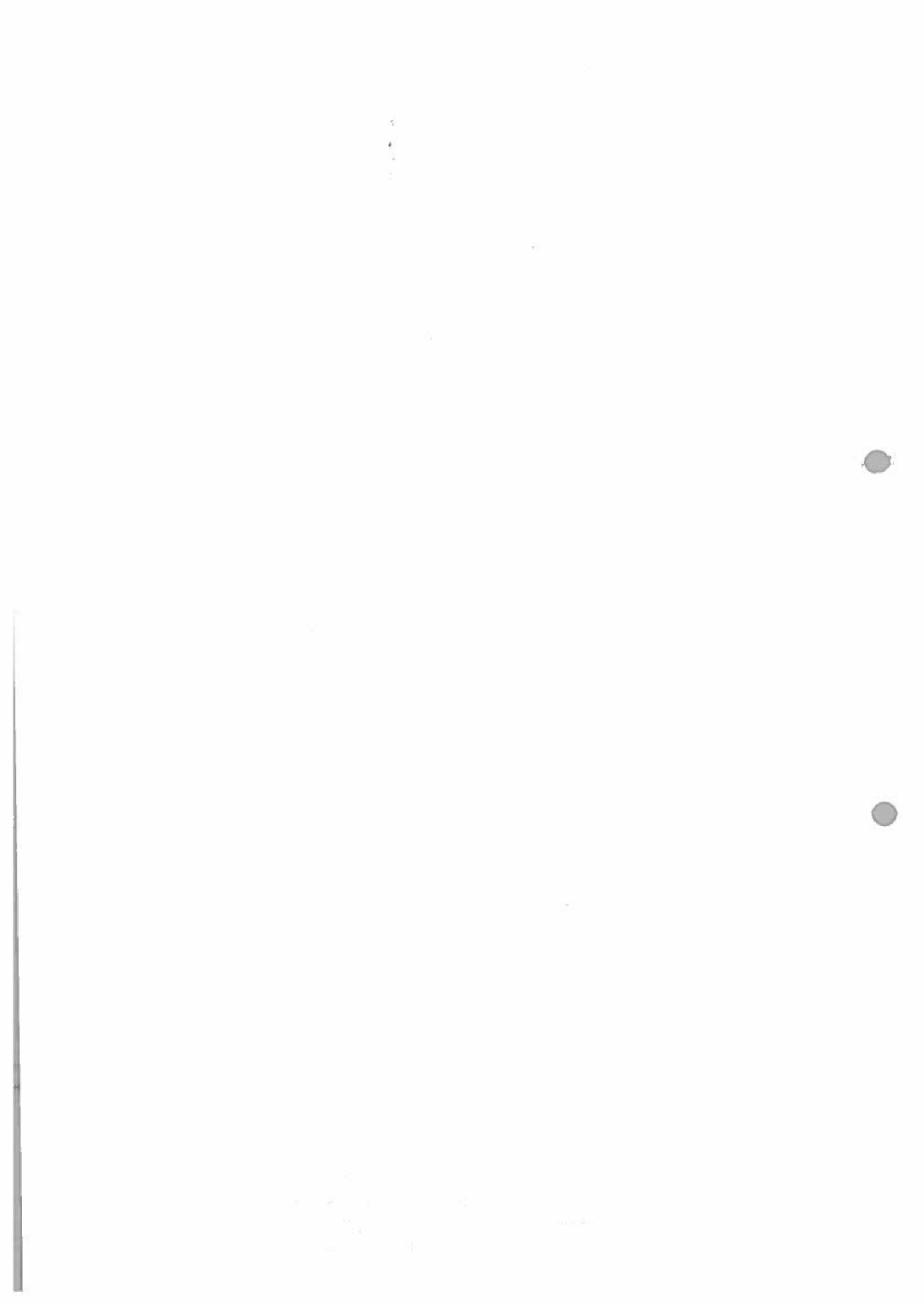
Degree	B. Tech.	Program	EEE (Honors)	Academic Year	2022- 2023
Course Code	20EEH04	Test Duration	3 Hrs. Max. Marks 70	Semester	V
Course	Electric Vehicle Technologies				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any two components of electric vehicle.	20EEH04.1	L1
2	Compare induction motor drive and BLDC motor drive.	20EEH04.2	L2
3	List the types of fuel cells used in electric vehicles.	20EEH04.3	L1
4	Write the EV charging standards.	20EEH04.4	L1
5	Differentiate Connected Mobility and Autonomous Mobility.	20EEH04.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Write short notes on Parallel HEVs.	6M	20EEH04.1	L2
6 (b)	Explain the architecture of PHEV & FCEV.	6M	20EEH04.1	L2
OR				
7 (a)	Discuss about sustainable transportation.	6M	20EEH04.1	L2
7 (b)	Write short notes on interdisciplinary nature of HEVs.	6M	20EEH04.1	L2
A three-phase 440V, 50Hz, 4-pole, 1380 rpm, star-connected induction motor has the following parameters per phase referred to the stator:				
8	$R_1=0.58\Omega$, $R_2=0.44\Omega$, $X_1=X_2=1.20\Omega$, $X_m=36\Omega$. The motor is controlled by a variable frequency control at a constant flux of rated value. Determine the motor speed and the stator current at half the rated torque and 25Hz.	12M	20EEH04.2	L3
OR				
9	Explain the principle of operation and analysis of BLDC motor drive.	12M	20EEH04.2	L2
10 (a)	Design 12V/400V, 500W power converter for EV.	6M	20EEH04.3	L3
10 (b)	Explain the hybridization of different energy storage devices.	6M	20EEH04.3	L2
OR				
11 (a)	Discuss the classification of control strategies in HEV.	6M	20EEH04.3	L2
11 (b)	Draw block diagram of plug-in electric vehicle and explain.	6M	20EEH04.3	L2
12 (a)	Discuss about G2V technology.	6M	20EEH04.4	L2
12 (b)	Explain about V2B technology.	6M	20EEH04.4	L2
OR				
13 (a)	Discuss about E-mobility business.	6M	20EEH04.4	L2
13 (b)	Write short notes on electrification challenges.	6M	20EEH04.4	L2
14	Discuss the case study E-mobility Indian roadmap perspective.	12M	20EEH04.5	L2
OR				
15 (a)	Discuss about North American EV plug standards.	6M	20EEH04.5	L2
15 (b)	Discuss on types of EV charging connector.	6M	20EEH04.5	L2



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Degree	B. Tech.	Program	CSE (AI & ML & DS) - Honors			Academic Year	2022 - 2023
Course Code	20DSH04	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Recommender Systems						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	How is rating policy defined in recommendation system?	20DSH04.1	L1
2	What is item profile?	20DSH04.2	L1
3	Distinguish between user-based and item-based recommendation in collaborative filtering.	20DSH04.3	L1
4	List any two limitations of hybridization strategies.	20DSH04.4	L1
5	Define offline evaluation and give an example.	20DSH04.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the different matrices operations associated with recommendation systems and discuss about covariance matrices.	6M	20DSH04.1	L2
6 (b)	Explain any two applications of recommendation systems with neat diagram.	6M	20DSH04.1	L2
OR				
7 (a)	Discuss any four key challenges faced while adopting recommendation systems.	6M	20DSH04.1	L2
7 (b)	Elaborate on the searching and filtering techniques used in recommendation system.	6M	20DSH04.1	L2
8 (a)	Discuss how Relevance feedback is provided in Rocchio's method.	6M	20DSH04.2	L2
8 (b)	Explain some of the suitable classification algorithms for content-based filtering.	6M	20DSH04.2	L2
OR				
9 (a)	Discuss about content-based filtering system with its high-level architectural representation.	6M	20DSH04.2	L2
9 (b)	Elaborate how to extract features in a document with examples.	6M	20DSH04.2	L2
10 (a)	Discuss about group recommendation systems.	6M	20DSH04.3	L2
10 (b)	Explain about the various possible attacks on collaborative recommender system.	6M	20DSH04.3	L2
OR				
11 (a)	Explain about the different types of recommendation systems.	6M	20DSH04.3	L2
11 (b)	How is matrix factorization used in collaborative recommendation system?	6M	20DSH04.3	L2
12 (a)	Explain about feature augmentation hybrid of monolithic hybridization design with needed mathematical formulation.	6M	20DSH04.4	L2
12 (b)	Explain parallelized hybridization design.	6M	20DSH04.4	L2
OR				
13	Discuss how to combine the recommendations of two or more recommendation systems by writing needed formula and give example of your choice.	12M	20DSH04.4	L2

14 (a)	What is evaluation? Discuss how evaluation is done on historical datasets.	6M	20DSH04.5	L2
14 (b)	Define scalability and serendipity. Explain with an example of your choice.	6M	20DSH04.5	L2
OR				
15 (a)	Discuss the way to measure the accuracy of ranks with needed examples.	6M	20DSH04.5	L2
15 (b)	Write short notes on the general properties of evaluation research.	6M	20DSH04.5	L2

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Degree	B. Tech. (U. G.)	Program	ECE (Honors)			Academic Year	2022- 2023
Course Code	20ECH04	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Hardware Design Using Verilog						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Module in Verilog HDL	20ECH04.1	L1
2	Define Simulation and Synthesis	20ECH04.2	L1
3	Write Application of Combinational Circuit.	20ECH04.3	L1
4	Distinguish between of Combinational Circuit and Sequential Circuits.	20ECH04.4	L1
5	Define Video Graphic Array.	20ECH04.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain Constructs for Modeling Timing Delays.	6M	20ECH04.1	L2
6 (b)	Explain Concurrency in Verilog HDL.	6M	20ECH04.1	L2
OR				
7 (a)	Discuss about levels of design description.	6M	20ECH04.1	L2
7 (b)	Compare Hardware Description Languages.	6M	20ECH04.1	L2
8 (a)	Explain the data types and operators.	6M	20ECH04.2	L2
8 (b)	Explain the difference between concatenation and replication.	6M	20ECH04.2	L2
OR				
9 (a)	Explain the Constants, Scalar and Vectors in Verilog.	6M	20ECH04.2	L2
9 (b)	Defining Keywords and Identifiers with an example.	6M	20ECH04.2	L2
10	Explain Combinational Circuit Design and write a Verilog HDL program for 8X1 Multiplexer.	12M	20ECH04.3	L2
OR				
11	Write a Verilog HDL code for 4 BCD Converter.	12M	20ECH04.3	L2
12	Design Module-10 Counter using D Flip Flop and Write Verilog HDL Code for Module-10 Counter.	12M	20ECH04.4	L2
OR				
13 (a)	Explain 4-Bit Shift register with neat diagram.	6M	20ECH04.4	L2
13 (b)	Write a Verilog HDL code for J K -Flip-Flop.	6M	20ECH04.4	L2
14	Explain about Inter- Integrated Circuit (I2C), Serial-Peripheral Interface and USB in Verilog HDL.	12M	20ECH04.5	L2
OR				
15 (a)	What is mean by Universal Asynchronous Receiver/Transmitter (UART) in Verilog?	6M	20ECH04.5	L2
15 (b)	Explain Serial Peripheral Interface (SPI) and write Verilog HDL code for leader transmission.	6M	20ECH04.5	L2

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Degree	B. Tech. (U. G.)	Program	CSE (Honors)	Academic Year	2021 - 2022	
Course Code	20CSH04	Test Duration	3 Hrs.	Max. Marks	70	
Course	GPU Architecture and programming				Semester	V

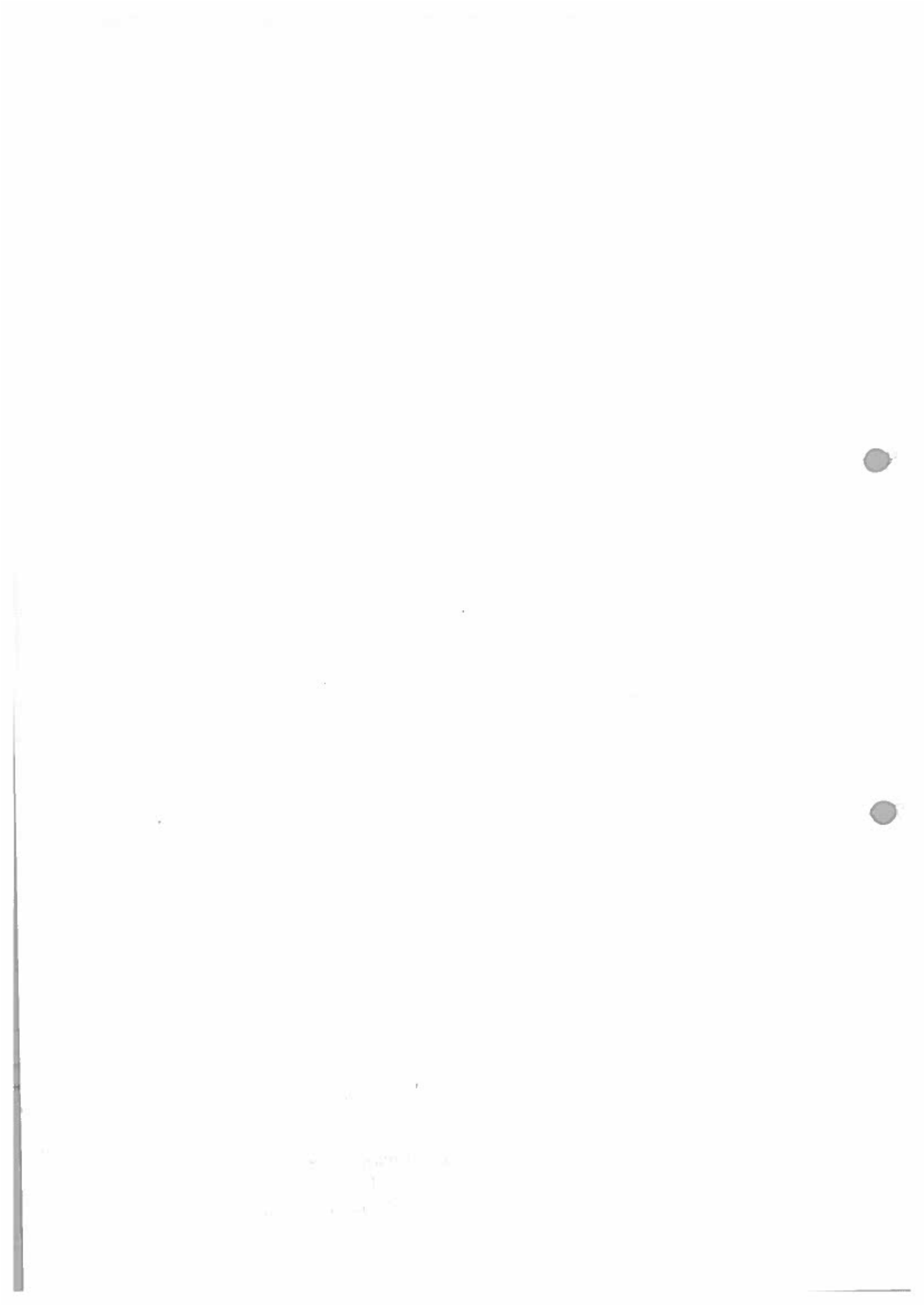
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Distinguish between serial and parallel architecture.	20CSH04.1	L1
2	Define resource contentions.	20CSH01.2	L1
3	List the different types of errors in CUDA.	20CSH01.3	L1
4	What is host device interaction?	20CSH01.4	L1
5	What do you mean by convolution? Give an example.	20CSH01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Discuss about processor architecture.	6M	20CSH01.1	L2
6 (b)	Explain the different performance evaluation strategies adopted in parallel systems.	6M	20CSH01.1	L2
OR				
7 (a)	Elaborate on any two-memory handling process in CUDA.	6M	20CSH01.1	L2
7 (b)	Explain about different scheduling techniques with example.	6M	20CSH01.1	L2
8 (a)	Explain about threads, blocks, grids and wraps.	6M	20CSH01.2	L2
8 (b)	Elaborate on any two-thread synchronization technique used in parallel programming paradigm.	6M	20CSH01.2	L2
OR				
9 (a)	List any five CUDA applications.	6M	20CSH01.2	L1
9 (b)	Elaborate on the different memory considerations for multiprocessor architecture.	6M	20CSH01.2	L2
10 (a)	Discuss about the parallel programming issues in CUDA.	6M	20CSH01.3	L2
10 (b)	Write a code to perform prefix sum computation and discuss how error can be found and avoided.	6M	20CSH01.3	L2
OR				
11 (a)	Discuss how CUDA applications can be optimized by considering problem decompositions as example.	6M	20CSH01.3	L2
11 (b)	Explain with an example code for CUDA error handling mechanism.	6M	20CSH01.3	L2
12	Explain with neat diagram for memory models in OpenCL by carefully providing instructions to set execution environment.	12M	20CSH01.4	L2
OR				
13	Explain the basic programming constructs of OpenCL and develop an OpenCL program to find cube of all elements in a collection of numbers.	12M	20CSH01.4	L2
14	Discuss about how to parallelize the matrix multiplication in multiprocessor system and also develop an algorithm to perform the same.	12M	20CSH01.5	L2
OR				
15	Explain how to program heterogeneous cluster with neat architectural representation and also write an example program for the same.	12M	20CSH01.5	L2

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Degree	B. Tech. (U. G.)	Program	Civil Engineering (Honors)			Academic Year	2022- 2023
Course Code	20CEH05	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Architecture and Town planning						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is importance of scale and proportion in elements of design?	20CEH05.1	L1
2	List any two new materials and techniques in industrial revolution.	20CEH05.2	L1
3	Give any two main points in the concept of linear city.	20CEH05.3	L2
4	Compare grid iron and radial town planning.	20CEH05.4	L1
5	What is the scope of town planning?	20CEH05.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are the elements of design and explain in detail.	6M	20CEH05.1	L2
6 (b)	Explain the importance of creation of 2D and 3D compositions.	6M	20CEH05.1	L2
OR				
7 (a)	Explain the importance of value and colour in elements of design.	6M	20CEH05.1	L2
7 (b)	List out the principles of design and explain in detail about each principle.	6M	20CEH05.1	L2
8 (a)	Explain in detail the emergence of an engineer.	6M	20CEH05.2	L2
8 (b)	Explain in detail about pioneers of modern architecture.	6M	20CEH05.2	L2
OR				
9 (a)	Explain the evolution of balloon frame and steel frame.	6M	20CEH05.2	L2
9 (b)	Define and explain the concept of modern architecture.	6M	20CEH05.2	L2
10 (a)	Explain in scope and motives of town planning.	6M	20CEH05.3	L2
10 (b)	Define town planning and explain garden city movement concept.	6M	20CEH05.3	L2
OR				
11 (a)	Explain in detail about development of town planning in ancient valley civilizations.	6M	20CEH05.3	L2
11 (b)	Explain the concept La-cite industrille city concept of city development.	6M	20CEH05.3	L2
12 (a)	What are different types of towns and their functions?	6M	20CEH05.4	L1
12 (b)	Differentiate between irregular and mixed types of town planning.	6M	20CEH05.4	L2
OR				
13 (a)	Explain the parameters that would be considered in deciding the type of pattern in town planning.	6M	20CEH05.4	L2
13 (b)	What are the advantages of radial pattern?	6M	20CEH05.4	L1
14 (a)	Explain about city rehabilitation and slum clearance.	6M	20CEH05.5	L2
14 (b)	Explain the concept of master plan and its importance in town planning.	6M	20CEH05.5	L2
OR				
15 (a)	Explain the scope of city planning.	6M	20CEH05.5	L2
15 (b)	Explain the procedure and importance of zoning.	6M	20CEH05.5	L2

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Semester End Regular Examination, Nov./Dec., 2022

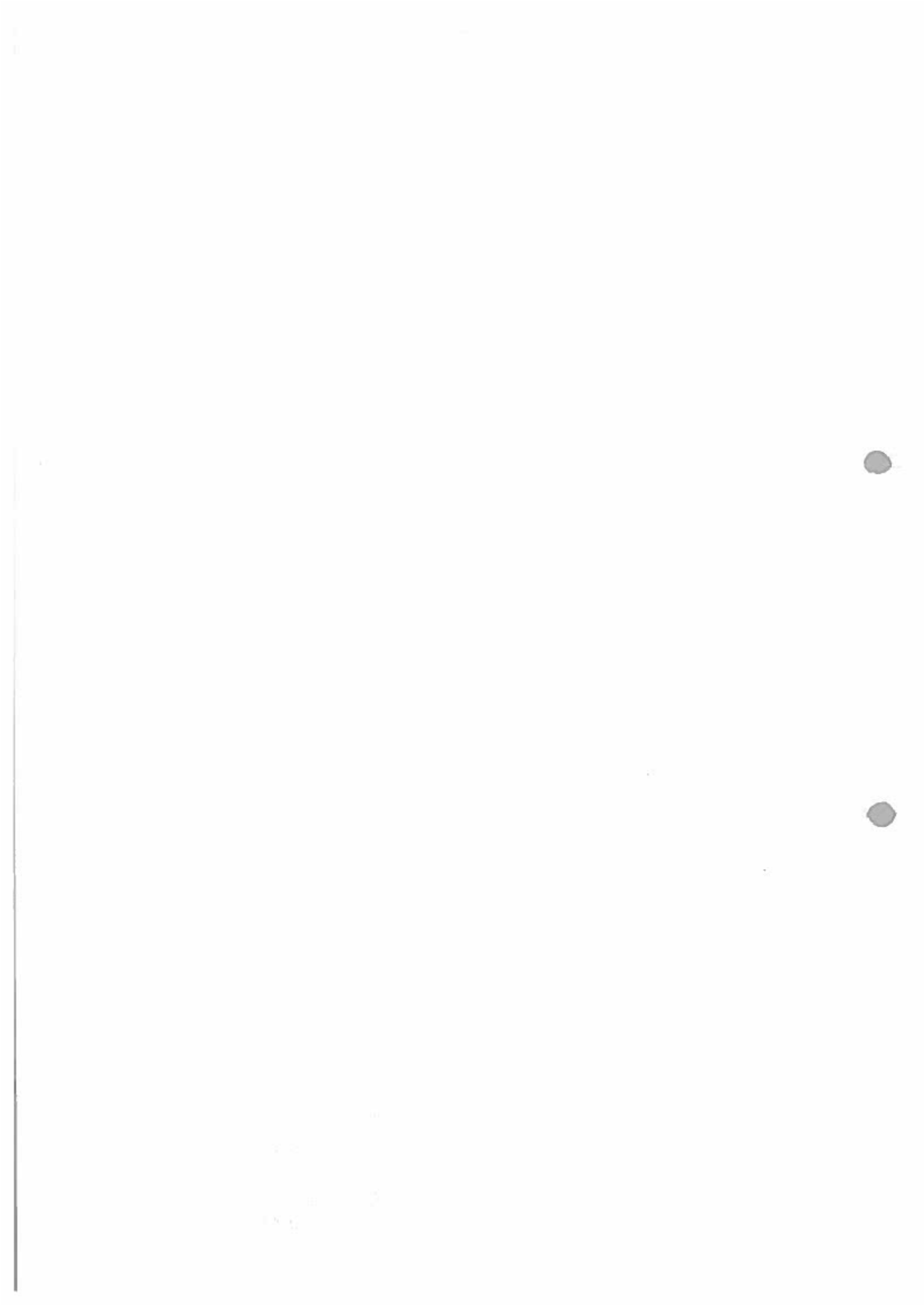
Degree	B. Tech.	Program	Common to All (Minor with Specialization)			Academic Year	2022 - 2023
Course Code	20AIM02	Test Duration	3 Hrs.	Max. Marks	70	Semester	V
Course	Machine Learning with Python						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Distinguish between list and tuple in Python.	20AIM02.1	L2
2	List any four NumPy array attributes.	20AIM02.2	L1
3	Distinguish between supervised and unsupervised learning.	20AIM02.3	L2
4	List all the types of unsupervised learning.	20AIM02.4	L1
5	What is one-hot encoding? Give an example.	20AIM02.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 11)	Marks	Learning Outcome (s)	DoK
6 (a)	Write a short note on comparison operators and expressions in Python.	6M	20AIM02.1	L2
6 (b)	Develop a python program to display true if at least one common element is present in the list without using any built-in functions.	6M	20AIM02.1	L2
OR				
7 (a)	Explain control statements' flow of execution in Python.	6M	20AIM02.1	L2
7 (b)	Write a Python program to find max. and min. value in Dictionary without using built-ins.	6M	20AIM02.1	L2
8 (a)	Explain any two ways to slice an array using the NumPy Slicing operator.	6M	20AIM02.2	L2
8 (b)	Write a python code snippet using Pandas library to detect and drop null values.	6M	20AIM02.2	L2
OR				
9 (a)	How to add multiple legends to the same axis using Matplotlib? Explain with example.	6M	20AIM02.2	L2
9 (b)	Create a one-dimensional NumPy array using arange function and write a Python code to access every third element starting from index 2.	6M	20AIM02.2	L2
10 (a)	Define mean, median, mode, standard deviation and percentile. Also explain it with an example.	6M	20AIM02.3	L2
10 (b)	Explain decision tree algorithm with an example.	6M	20AIM02.3	L2
OR				
11	Explain SVM algorithm with an example.	12M	20AIM02.3	L2
12 (a)	Write an algorithm to perform agglomerative clustering and demonstrate it with an example of your own.	6M	20AIM02.4	L2
12 (b)	Discuss about the challenges in working with unsupervised learning.	6M	20AIM02.4	L2
OR				
13	Explain K Means clustering algorithm and apply to {8, 44, 50, 58, 84} to partition into 2 clusters.	12M	20AIM02.4	L2
14	Discuss in detail about the automatic feature selection and also explain about the evaluation metrics and scoring techniques using in machine learning techniques.	12M	20AIM02.5	L2
OR				
15	Explain cross-validation and grid search based model evaluation technique.	12M	20AIM02.5	L2





Semester End Regular/Supplementary Examination, August, 2022

Degree	B. Tech. (U. G.)	Program	Common to All	Academic Year	2021- 2022
Course Code	20BSX12	Test Duration	3 Hrs. Max. Marks 70	Semester	II
Course	PARTIAL DIFFERENTIAL EQUATIONS AND VECTOR CALCULAS				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Find the differential equation of all spheres of fixed radius having their centers in the xy - plane.	20BSX12.1	L1
2	Solve $(D - D')(D + D' - 3)z = 0$.	20BSX12.2	L2
3	Compute $\beta(\frac{3}{2}, \frac{1}{2})$.	20BSX12.3	L2
4	Define Solenoidal and Irrotational vectors.	20BSX12.4	L1
5	Write the Statement of Gauss Divergence Theorem.	20BSX12.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Form PDE by eliminating the arbitrary function f from $z = f(x^2 + y^2) + x + y$.	6M	20BSX12.1	L2
6 (b)	Solve $x(y - z)p + y(z - x)q = z(x - y)$.	6M	20BSX12.1	L2
OR				
7 (a)	Solve $(\frac{p}{2} + x)^2 + (\frac{q}{2} + y)^2 = 1$.	8M	20BSX12.1	L3
7 (b)	Solve $x^2 p^2 + y^2 q^2 = z^2$.	4M	20BSX12.1	L2
8 (a)	Solve $(D^2 - 2DD')z = e^x + x^2 y$.	6M	20BSX12.2	L3
8 (b)	Solve $(4D^2 - 4DD' + D'^2)z = 16 \log(x + 2y)$.	6M	20BSX12.2	L2
OR				
9 (a)	Solve $(D - D' - 1)(D - D' - 2)z = e^{2x - y}$.	6M	20BSX12.2	L2
9 (b)	Solve $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$, $u(x, 0) = 6e^{-3x}$ by the method of separation of variables.	6M	20BSX12.2	L3
10 (a)	Prove that $\int_{-1}^1 (1+x)^{p-1} (1-x)^{q-1} dx = 2^{p+q-1} \beta(p, q)$.	6M	20BSX12.3	L3
10 (b)	Evaluate $\int_1^e \int_1^{\log y} \int_1^{e^x} \log z dz dy dx$.	6M	20BSX12.3	L2
OR				
11 (a)	Prove that $\int_0^1 \frac{x}{\sqrt{1-x^5}} dx = \frac{1}{5} \beta(\frac{2}{5}, \frac{1}{2})$.	6M	20BSX12.3	L3
11 (b)	Show that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $\frac{16}{3} a^2$.	6M	20BSX12.3	L2

- The derivative of $f(x, y, z)$ at a point P is greatest in the direction of
- 12 (a) $\nu = i - j - k$. In this direction, the value of the derivative is $3\sqrt{3}$. 6M 20BSX12.4 L3
Find the gradient vector at P.
- Determine the constants a, b, c so that
- 12 (b) $A = (x + 2y + az)i + (bx - 3y - z)j + (4x + cy + 2z)k$ 6M 20BSX12.4 L3
is irrotational.
- OR
- 13 (a) If $\vec{F} = \text{grad}(x^3 + y^3 + z^3 - 3xyz)$ Find $\text{div } \vec{F}$ and $\text{curl } \vec{F}$. 6M 20BSX12.4 L3
- 13 (b) Prove that $\text{div}(\text{grad}r^m) = m(m + 1)r^{m-2}$. 6M 20BSX12.4 L2
- OR
- 14 Verify Green's theorem for $\int_C [(xy + y^2)dx + x^2 dy]$, where C 12M 20BSX12.5 L3
is bounded by $y = x$ and $y = x^2$.
- OR
- 15 Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$ taken around 12M 20BSX12.5 L3
the rectangle bounded by the lines $x = \pm a, y = 0, y = b$.

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Semester End Regular/Supplementary Examination, August, 2022

Degree	B. Tech. (U. G.)	Program	CE/ME/CSE/CSM/CSD	Academic Year	2021 - 2022
Course Code	20ESX05	Test Duration	3 Hrs.	Max. Marks	70
Course	Basic Electrical and Electronics Engineering				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Explain Kirchoff's laws.	20ESX05.1	L2
2	Write the EMF equation of a DC Generator.	20ESX05.2	L1
3	What is the difference between DC generator and alternator?	20ESX05.3	L1
4	Write the relation between primary and secondary voltages and currents of a single-phase transformer.	20ESX05.4	L1
5	Mention any two applications of a diode.	20ESX05.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Derive star-delta and delta-star transformations.	12M	20ESX05.1	L2

OR

7 (a)	In an A.C. circuit, $v = 200 \sin(\omega t + 300)$ V, $i = 15 \sin(\omega t - 300)$ A. Find the active and reactive power. Find the current through and the voltage across all the elements in the circuit by applying Kirchoff's laws as shown in the Fig. 7(b).	6M	20ESX05.1	L2
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7 (b)		6M	20ESX05.1	L2
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Fig.7(b)

8 (a)	Derive the emf equation of simplex wave wound DC generator.	4M	20ESX05.2	L2
8 (b)	Explain the construction of a DC generator.	8M	20ESX05.2	L2

OR

9 (a)	Derive the torque equation of a DC Motor. A DC shunt machine develops an A.C. emf. of 250V, at 1500 rpm.	8M	20ESX05.2	L2
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9 (b)	Find it's torque and mechanical power developed for an armature current of 50A.	4M	20ESX05.2	L2
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10 (a)	What are the merits and demerits of induction motor?	6M	20ESX05.3	L1
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10 (b)	A 3-phase, 60 Hz induction motor has 2 poles. If the slip is 2% at a certain load, determine: i) The synchronous speed ii) The speed of the rotor and iii) The frequency of the induced e.m.f.'s in the rotor.	6M	20ESX05.3	L2
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OR

11 (a)	Explain the working principle of 3- Φ induction motor.	6M	20ESX05.3	L2
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11 (b)	Explain Speed-Torque Characteristics of 3- Φ induction Motor with neat sketches.	6M	20ESX05.3	L2
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12 (a)	Derive an expression for emf induced in a transformer secondary winding if V_1 volts applied across its primary winding.	4M	20ESX05.4	L2
12 (b)	Explain open circuit and short circuit test on a transformer.	8M	20ESX05.4	L2
OR				
13	Explain the construction of 1- Φ transformer.	12M	20ESX05.4	L2
OR				
14	Explain the working of p-n junction diode both in forward and reverse biases conditions.	12M	20ESX05.5	L2
OR				
15 (a)	Draw the circuit diagram of half wave rectifier and explain its operation.	8M	20ESX05.5	L2
15 (b)	Draw the circuit diagram of non-inverting amplifier and derive the expression for its output voltage.	4M	20ESX05.5	L2

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Semester End Regular/Supplementary Examination, August, 2022

Degree	B. Tech. (U. G.)	Program	ECE	Academic Year	2021 - 2022
Course Code	20ESX01	Test Duration	3 Hrs. Max. Marks	70	Semester
Course	ENGINEERING DRAWING				

Part A (Short Answer Questions 2 x 5 = 10 Marks)

No.	Questions (1 through 2)	Learning Outcome (s)	DoK
1	A hexagonal plate side of base 30mm and it is resting on HP and perpendicular to VP.	20ESX01.3	L1
2	A straight line AB is 60mm above HP and 50mm in front of the VP. The line inclined with an angle of 30° to HP and parallel to VP. Draw its projections.	20ESX01.2	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 10)	Learning Outcome (s)	DoK
3 (a)	Construct a pentagon of side 40mm when one side is Horizontal.	20ESX01.1	L2
3 (b)	The foci of an ellipse are 108 mm apart and the major axis is 120 mm long. Construct an ellipse using oblong method. Draw a tangent and normal to the ellipse at a point on it 50 mm from its centre	20ESX01.1	L3
OR			
4 (a)	Draw a full size diagonal scale of RF=2 and long enough to measure up to 5 centimeters. Show on this scale the following distances 2.35 centimeters	20ESX01.1	L3
4 (b)	Draw a vernier scale of R.F=5 to read 1/5 cm and 1/25 cm and to measure up to 5 cm. Mark on the scale distances of 2.12 cm	20ESX01.1	L2
5 (a)	Draw the projections of a straight line AB of 60mm long, in the following positions: (i) Perpendicular to the HP and parallel to VP (ii) Parallel to and 30 mm in front of the VP and on the HP (iii) Inclined at 30° to the VP and parallel to HP	20ESX01.2	L2
5 (b)	A line PQ, 100 mm long, is inclined at 45° to the H.P and at 30° to the VP. A point P is 40mm from both the planes. Draw the projections of PQ.	20ESX01.2	L3
OR			
6	A line CD, 80mm long, it is inclined at 25° to HP and 30° to VP. End C in the first quadrant and 25 mm and 15 mm from HP and VP respectively. Draw the projections; find true length and true inclination. Locate the traces	20ESX01.2	L2
7 (a)	Draw a rhombus of diagonals 100 mm and 60 mm long, with the longer diagonal horizontal. The figure is the top view of a square of 100 mm long diagonals, with a corner on the ground. Draw its front view and determine the angle which its surface makes with the ground.	20ESX01.3	L2
7 (b)	Hexagonal plate of negligible thickness is of 25 mm side, lying in such a way that one of its corners touches on the HP and the plane makes an angle of 60° with the HP and 30° with the VP. Draw the projections.	20ESX01.3	L3

OR

8 (a) The circular plate of negligible thickness and 50mm diameter is on the HP and 30° inclined to HP and 45° inclined to VP. Draw its projections. 20ESX01.3 L2

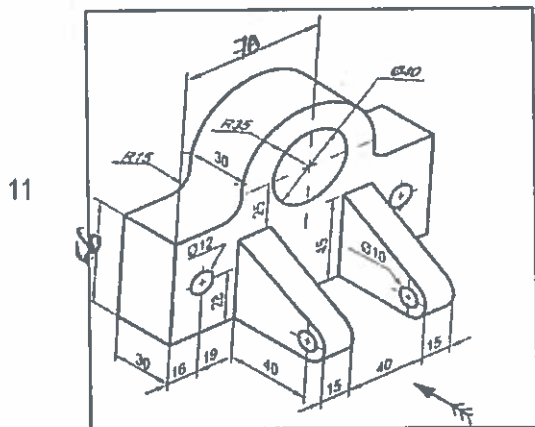
8 (b) A mirror of size 560mm \times 320mm is fixed on a wall on one of its shorter edges. The mirror is so fixed that it appears as a square in the front view. Draw the projections of the mirror Find its inclinations with the wall and the ground? 20ESX01.3 L3

9 A pentagonal prism, side of base 25mm and axis 50mm long rests with one of its edges on the HP such that the base containing that edge makes an angle of 30° to the HP and its axis is parallel to the VP. Draw its projections. 20ESX01.4 L2

OR

10 Draw the projections of a pentagonal prism of base side 30mm and axis length 60mm rests on the HP. The axis is inclined at 45° to the HP and parallel to the VP? 20ESX01.4 L3

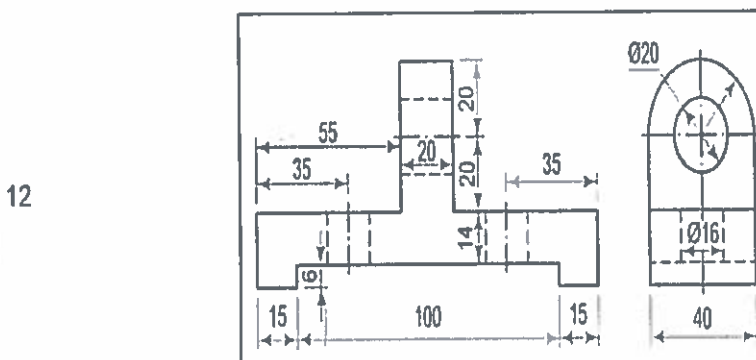
Draw the front view, top view and side view from the isometric view. All dimensions are in mm.



20ESX01.5 L4

OR

Draw the isometric view of Fig.



20ESX01.5 L4

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Semester End Regular/Supplementary Examination, August, 2022

Degree	B. Tech. (U. G.)	Program	CE, EEE & ME	Academic Year	2021 - 2022
Course Code	20ESX04	Test Duration	3 Hrs. Max. Marks 70	Semester	II
Course	ENGINEERING MECHANICS				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Triangle Law of Forces	20ESX04.1	L1
2	State the laws of Friction	20ESX04.2	L1
3	State the location of Centroid of Semi Circle whose Radius is R with a sketch	20ESX04.3	L1
4	Differentiate between Rectilinear and Curvilinear Motions	20ESX04.4	L2
5	State the Work Energy Theorem	20ESX04.5	L1

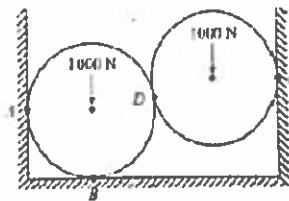
Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Define Force, components of the Force, and the Resultant of the Force with examples	6M	20ESX04.1	L2
6 (b)	State and prove Lami's theorem	6M	20ESX04.1	L2

OR

7 (a)	Define the Free body Diagram, illustrate with two examples Two spheres each of 1000N and of radius 25cm rest in a horizontal channel of width 90cm as Shown in figure. Find the reaction at the point of Contact A, B and C	6M	20ESX04.1	L2
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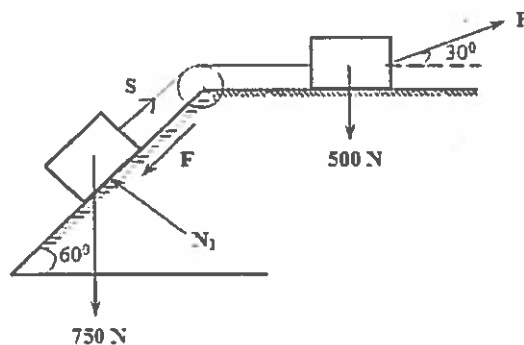
7 (b)



6M	20ESX04.1	L3
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What is the value of P in the system shown in the figure to cause the motion to impend? Assume the pulley is smooth and coefficient of friction between the other two contact surfaces is 0.20

8 (a)

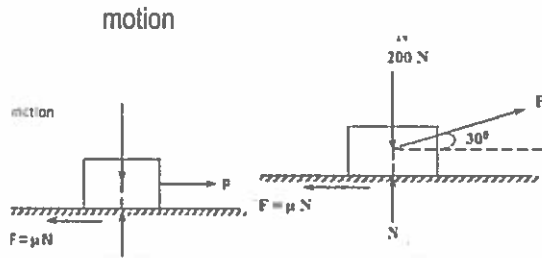


8M	20ESX04.2	L3
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8 (b)	What are the different conditions of Equilibrium, also write the equilibrium equations in Spatial force System	4M	20ESX04.2	L1
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OR

9 (a)	A body of weight 200 N is placed on a rough horizontal plane. If the coefficient of friction between the body and horizontal plane is 0.3, determine a) Horizontal force required to impend motion b) Pull at an angle 30° to horizontal required to impend	8M	20ESX04.2	L2
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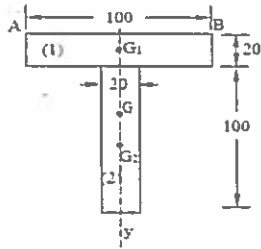
- 9 (b) A Block weighing 'W' Newton's is placed upon a plane inclined at an angle ' θ ' with Horizontal. What happens if the angle of friction ' Φ ' is (a) greater than ' θ ' (b) equal to ' θ ' (c) less than ' θ '
 Locate the centroid of T - section shown in figure

4M

20ESX04.2

L3

10 (a)



6M

20ESX04.3

L3

- 10 (b) Differentiate between Centroid and Centre of Gravity
 OR

6M

20ESX04.3

L2

- 11 (a) Locate the centroid of a Frustum of a cone of height 8cm and having a Diameter of 5cm and 8cm at top and bottom of the frustum of the cone respectively.

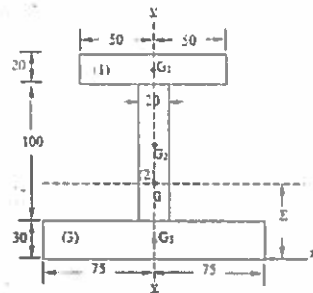
4M

20ESX04.3

L2

Locate the centroid of the following figure

11 (b)



8M

20ESX04.3

L3

12 (a)

A lift can operate under a maximum of 8 persons; mass of the lift is 800Kg. Determine the limits of tension if the lift accelerates at constant rate of 1 m/s^2 either upwards or downwards. Take average weight of a person as 750N

6M

20ESX04.4

L3

A motorist travelling at a speed of 70 kmph, suddenly applies brakes and halts after 50m. Determine

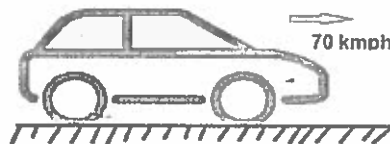
12 (b)

- The time required to stop the car
- The coefficient of friction between the tyres and the road

6M

20ESX04.4

L3



OR

A Particle is projected vertically upwards from the ground with an initial velocity of $u \text{ m/sec}$. find

13 (a)

- The time taken to reach the maximum height
- The maximum height reached
- Time required for descending
- Velocity when it strikes the ground. Consider

6M

20ESX04.4

L3

the upward motion of the particle

13 (b)	A bullet fired from a height of 120m at a velocity of 360km/hr. at an angle of 300° upwards, neglecting the Air Resistance, find a)total time of flight b)Horizontal Range of bullet, c) Max .height reached by the bullet d)final velocity of the bullet just before touching the ground	6M	20ESX04.4	L3
14	Find the Power of a locomotive, drawing a train whose weight including that of engine is 420 kN up an incline 1 in 120 at a steady speed of 56 kmph, the frictional resistance being 5 N/kN. While the train is ascending the incline, the steam is shut off. Find how far it will move before coming to rest, assuming that the resistance to motion remains the same	12M	20ESX04.5	L3
OR				
15	Derive the Work Energy equation for translation.	12M	20ESX04.5	L3

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Semester End Regular/Supplementary Examination, August, 2022

Degree	B. Tech. (U. G.)	Program	ECE	Academic Year	2021- 2022
Course Code	20EE201	Test Duration	3 Hrs.	Max. Marks	70
Course	Network Analysis and Synthesis		Semester	II	

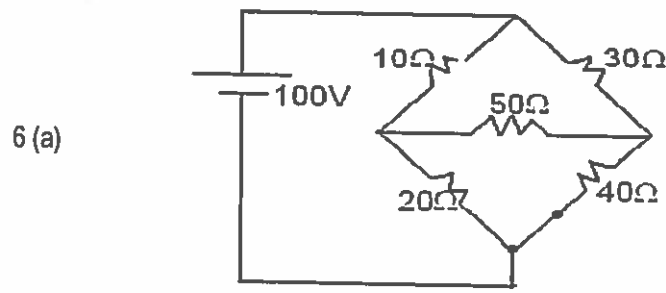
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Write about source transformation.	20EE201.1	L1
2	State Norton's Theorem.	20EE201.2	L1
3	Define time constant and write its significance.	20EE201.3	L1
4	Give the conditions of Series and Parallel resonance.	20EE201.4	L1
5	Write the relation between Z and Y parameters.	20EE201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
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Determine the current through 50 ohm resistor

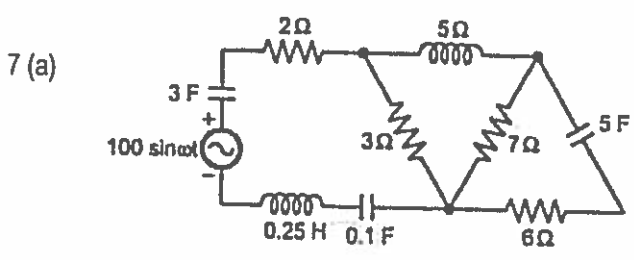


6 (a)		6M	20ESX05.1	L3
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6 (b)	Explain Mesh Analysis with an example.	6M	20ESX05.1	L2
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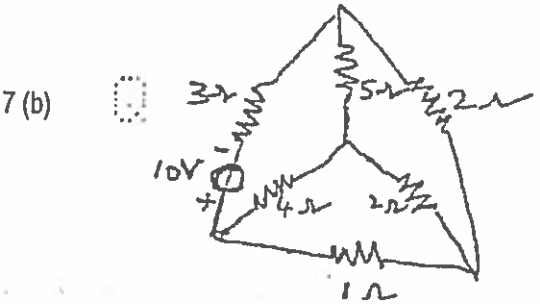
OR

For the network shown in Figure, draw the following
 a) Graph
 b) Tree
 c) Dual network.



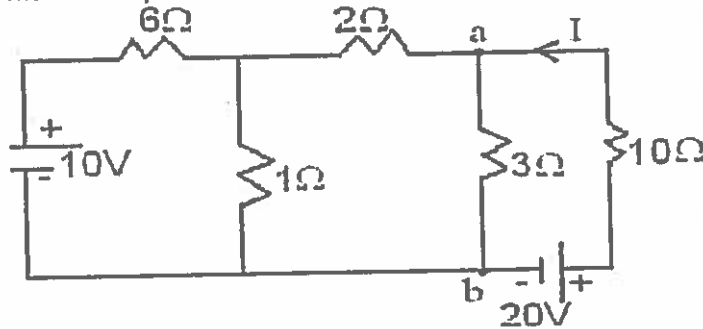
7 (a)		6M	20ESX05.1	L2
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For the following network writedown number of branches,nodes and links. Write incidence matrix also



7 (b)		6M	20ESX05.1	L3
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- 8 (a) State and Explain Compensation theorem with an Example.
Replace the network to the left of the terminals 'ab' by its Thevenin's equivalent circuit. Hence determine 'I'.



8(b)

8M

20ESX05.2

L2

4M

20ESX05.2

L3

OR

- 9 (a) Realize $Z(s) = (S^3 + 4S)/(S^4 + 10S^2 + 9)$ in Cauer I forms
9 (b) State and explain the properties of positive real function

6M

20ESX05.2

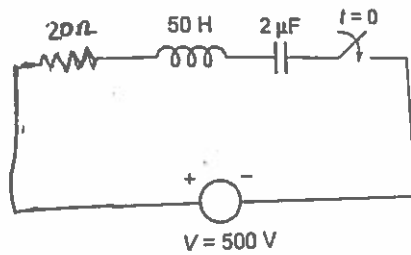
L3

6M

20ESX05.2

L2

From the RLC circuit given find $i(0^+)$, di/dt and d^2i/dt^2 at $t=0^+$, if the switch is closed at $t=0$



10

12M

20ESX05.3

L3

OR

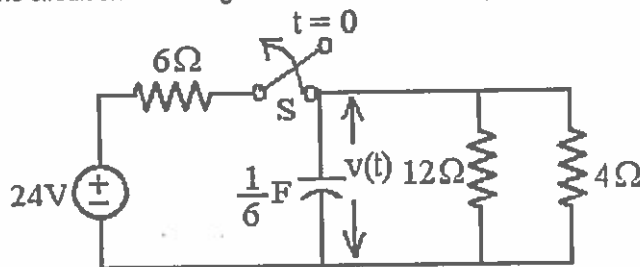
- 11 (a) Describe the procedure for evaluation of initial conditions of R, L and C.
Find $v(t)$ for $t \geq 0$ and initial energy stored across a capacitor for the circuit shown in Fig.1. When the switch is opened at $t = 0$.

6M

20ESX05.3

L2

11(b)



6M

20ESX05.3

L3

- 12 (a) Explain dot conversion for coupled circuits.
12 (b) Derive expression for self and mutual inductance.

4M

20ESX05.4

L2

8M

20ESX05.4

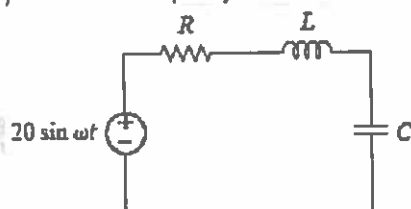
L3

OR

In the circuit shown in below Figure.6 $R = 2$ ohms, $L = 1$ mH, and $C = 0.4$ μ F.

- a) Find the resonant frequency and the half-power frequencies.
b) Calculate the quality factor and bandwidth.

13



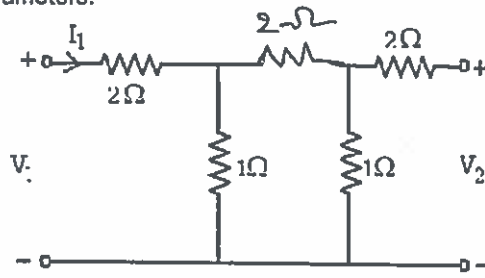
12M

20ESX05.4

L3

Determine Y – parameters of the below Figure. Hence determine the h-parameters.

14



12M

20ESX05.5

L3

OR

15(a)

Derive the relation between h-parameters and Z-parameters of a two port networks.

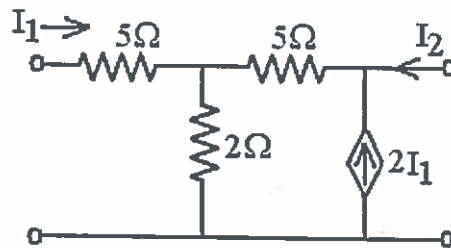
6M

20ESX05.5

L2

Determine the Z – Parameters and transmission parameters of the circuit shown in

15(b)



6M

20ESX05.5

L2

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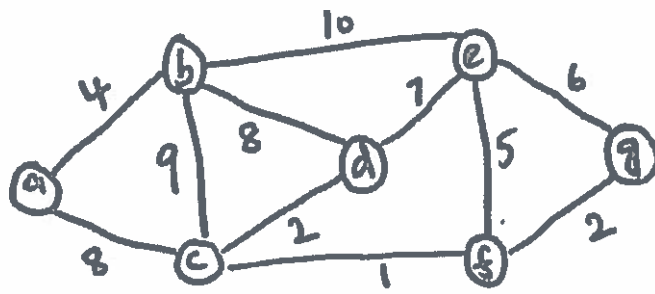
Degree	B. Tech. (U. G.)	Program	CSE/CSM/CSD			Academic Year	2021 - 2022
Course Code	20CS201	Test Duration	3 Hrs.	Max. Marks	70	Semester	II
Course	Data Structures Using 'C'						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define time complexity and space complexity.	20CS201.1	L1
2	Compare Linked list with Arrays.	20CS201.2	L1
3	Define a stack with an example.	20CS201.3	L1
4	Define a Binary tree with an example.	20CS201.4	L1
5	List any 4 applications of spanning trees.	20CS201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the Binary search with an example.	6M	20CS201.1	L2
6 (b)	Explain the Bubble sort with time complexity.	6M	20CS201.1	L2
OR				
7 (a)	Explain algorithm for Linear Search with an example.	6M	20CS201.1	L2
7 (b)	Write the insertionsort algorithm and apply it to sort the following elements 11, 25, 13, 32, 17	6M	20CS201.1	L2
8 (a)	Explain the Single linked list representation and traverse the List.	6M	20CS201.2	L2
8 (b)	Explain with an algorithm to insert and delete elements using Single Linked List.	6M	20CS201.2	L2
OR				
9 (a)	Explain the Double linked list with examples.	6M	20CS201.2	L2
9 (b)	Explain Sparse Matrix Representation using Linked List.	6M	20CS201.2	L2
10 (a)	Explain the conversion of infix to postfix with expression: $a+b*c+(d*e+f)*g$	6M	20CS201.3	L2
10 (b)	Explain the applications of Stack.	6M	20CS201.3	L2
OR				
11 (a)	Write an algorithm to perform Circular Queue with an example.	6M	20CS201.3	L2
11 (b)	What are the differences between priority queues and Dqueue?	6M	20CS201.3	L2
12 (a)	Explain the In order, pre order, post order tree traversal with an example.	6M	20CS201.4	L2
12 (b)	Explain the Binary Tree and Binary Search Tree.	6M	20CS201.4	L2
OR				
13	Construct a Binary Tree from the following list In order : 4 10 12 15 18 22 24 Pre order: 24 15 10 4 12 22 18	12M	20CS201.4	L3
14 (a)	Compare Breadth First Search with Depth First Search.	6M	20CS201.5	L2
14 (b)	Explain Breadth First Search with examples.	6M	20CS201.5	L2
OR				
15	Find the minimum cost spanning tree by using Prim's Algorithm.	12M	20CS201.5	L3



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Degree	B. Tech. (U. G.)	Program	CE/ME	Academic Year	2021- 2022
Course Code	20BSX31	Test Duration	3 Hrs. Max. Marks 70	Semester	II
Course	Engineering Physics				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define interference.	20BSX31.1	L1
2	What do you mean by Stimulated emission	20BSX31.2	L1
3	Define Orientation polarization and write the expression for orientation polarizability.	20BSX31.3	L1
4	Define Non-Destructive Testing.	20BSX31.4	L1
5	Define packing fraction and write the formula for packing fraction.	20BSX31.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain how Newton's Rings are formed in the reflected light and show that the diameter of dark ring is proportional to \sqrt{n} .	10M	20BSX31.1	L2
6 (b)	Calculate the fringe width, if the two slits separated by 0.2 mm are illuminated by sodium light of wavelength 5893 Angstrom unit and the screen is 10 cm away from the slits.	2M	20BSX31.1	L2

OR

7 (a)	Describe Fraunhofer's diffraction due to a single slit and deduce the condition for primary maxima, secondary maxima and minima.	8M	20BSX31.1	L2
7(b)	A monochromatic light of wavelength 6.56×10^{-7} m incident normally on a grating of 2 cm wide. The first order spectrum is produced at an angle of 18° from the normal. Calculate the total number of lines in the grating.	4M	20BSX31.1	L2
8 (a)	List out few applications of laser.	4M	20BSX31.2	L1
8 (b)	Explain the construction and working of Ruby Laser.	8M	20BSX31.2	L2

OR

9 (a)	List out few applications of optical fibers and derive the expression for numerical aperture and acceptance angle.	10M	20BSX31.2	L2
9 (b)	The refractive indices of core and cladding of an optical fiber are 1.45 and 1.15 respectively. Determine the numerical aperture and acceptance angle of this optical fiber.	2M	20BSX31.2	L2

10	Explain how various magnetic materials like Dia, Para and Ferromagnetic materials are distinguished based on different properties like susceptibility, permeability etc.	12M	20BSX31.3	L2
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OR

11	Describe various types of polarizations in dielectrics.	12M	20BSX31.3	L2
12 (a)	Explain how the absorption coefficient of an acoustic material can be determined.	8M	20BSX31.4	L2
12(b)	The total absorption coefficient of all the materials in a hall is 733.33 Open Window Units. If the volume of this hall is 8000 m^3 then determine the Reverberation time using Sabine's formula.	4M	20BSX31.4	L2

OR

13 (a)	Explain Magnetostriction effect and discuss generation of ultrasonics using this method.	10M	20BSX31.4	L2
13 (b)	List any four applications of ultrasonics.	2M	20BSX31.4	L1
14	Determine the packing fraction of SC, BCC and FCC.	12M	20BSX31.5	L2
OR				
15 (a)	A plane of atoms makes 2a, 3b and 4c intercepts on the crystallographic axes. Similarly, another plane of atoms makes 4a, 6b and 8c intercepts on the crystallographic axes. Determine the Miller indices for these two different planes and comment on the result.	4M	20BSX31.5	L3
15 (b)	Explain the Powder method of X – ray diffraction with relevant sketches.	8M	20BSX31.5	L2

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Degree	B. Tech. (U. G.)	Program	EEE/CSE/CSM/CSD	Academic Year	2021 - 2022
Course Code	20BSX23	Test Duration	3 Hrs. Max. Marks 70	Semester	II
Course	APPLIED CHEMISTRY				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

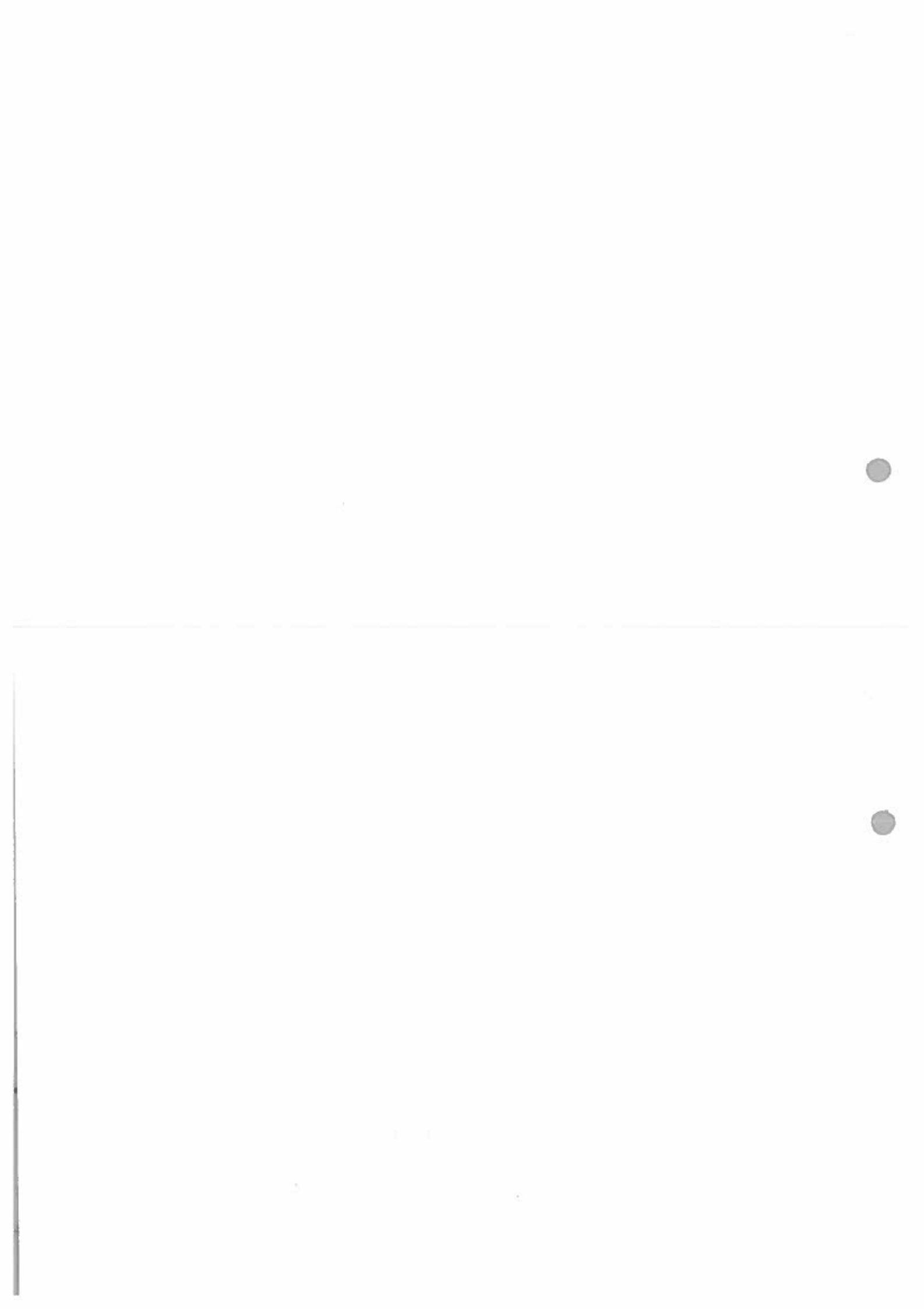
No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define glass transition temperature of plastics	20BSX23.1	L1
2	State the Nernst Equation.	20BSX23.2	L1
3	Define Bond order.	20BSX23.3	L1
4	How many signals appear in Toluene in ^{13}C -NMR Spectroscopy?	20BSX23.4	L1
5	What is supramolecular chemistry?	20BSX23.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Differentiate addition polymerization from condensation polymerization.	6M	20BSX23.1	L2
6 (b)	Differentiate between thermoplastics and thermosetting plastics.	6M	20BSX23.1	L2
OR				
7 (a)	Explain the mechanism of free radical chain polymerization of PVC.	6M	20BSX23.1	L2
7 (b)	Write the preparation properties and applications of i. Nylon 6, 6 ii. Bakelite.	6M	20BSX23.1	L2
8 (a)	Explain the construction and working of Pb-Acid battery.	6M	20BSX23.2	L2
8 (b)	Explain construction, working principle of Calomel Electrode.	6M	20BSX23.2	L2
OR				
9 (a)	Explain construction, working and applications of MeOH-O_2 fuel cell.	6M	20BSX23.2	L2
9 (b)	Discuss in detail about Electro chemical sensors with examples.	6M	20BSX23.2	L2
10 (a)	Draw the energy level diagrams of CO and N_2 molecule. Explain their magnetic nature and bond order.	7M	20BSX23.3	L2
10 (b)	Describe about a particle in 1-D box with suitable example.	5M	20BSX23.3	L2
OR				
11 (a)	Explain the crystal field splitting in tetrahedral complex and properties of $[\text{Ni}(\text{CN})_4]^{2-}$.	6M	20BSX23.3	L2
11 (b)	Illustrate energy level diagram of 1,3-Butadiene.	6M	20BSX23.3	L2
12 (a)	Explain principle and instrumentation of FT-IR Spectroscopy.	6M	20BSX23.4	L2
12 (b)	Define Lamberts-Beers law. Explain principle and Instrumentation of UV-Visible spectroscopy.	6M	20BSX23.4	L2
OR				
13 (a)	What are the principles involved in HPLC?	6M	20BSX23.4	L2
13 (b)	Explain the pH metric methods help to determine the endpoint in acid-base titration.	6M	20BSX23.4	L2
14 (a)	Write about computational chemistry.	6M	20BSX23.5	L2
14 (b)	Describe about Rotaxanes and give their applications.	6M	20BSX23.5	L2
OR				
15 (a)	Write a note on template synthesis of Macro cyclic ligands.	4M	20BSX23.5	L2
15 (b)	Discuss about cation binding, anion binding and simultaneous cation and anion binding.	8M	20BSX23.5	L2

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Degree	B. Tech. (U. G.)	Program	ECE	Academic Year	2021 - 2022
Course Code	20BSX33	Test Duration	3 Hrs. Max. Marks 70	Semester	II
Course	APPLIED PHYSICS				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define interference.	20BSX33.1	L1
2	List any four characteristics of LASER.	20BSX33.2	L1
3	List any two applications of dielectric materials.	20BSX33.3	L1
4	List any two merits of classical free electron theory.	20BSX33.4	L1
5	Classify Semiconductors.	20BSX33.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Derive the conditions for bright and dark fringes in the case of interference in thin films due to reflection.	12M	20BSX33.1	L2
OR				
7 (a)	Describe in detail Fraunhofer's diffraction due to a double slit.	8M	20BSX33.1	L2
7 (b)	A monochromatic light of wavelength 6.56×10^{-7} m incident normally on a grating of 2 cm wide. The first order spectrum is produced at an angle of 18° from the normal. Calculate the total number of lines in the grating.	4M	20BSX33.1	L2
8 (a)	Discuss in detail the construction and working of Ruby Laser.	10M	20BSX33.2	L2
8 (b)	List any two applications of LASER.	2M	20BSX33.2	L2
OR				
9 (a)	Deduce the expression for numerical aperture and acceptance angle.	10M	20BSX33.2	L2
9 (b)	The refractive indices of core and cladding of an optical fiber cable are 1.3 and 1.2 respectively. Determine the numerical aperture and acceptance angle of the optical fiber cable.	2M	20BSX33.2	L2
10	Classify various types of magnetic materials.	12M	20BSX33.3	L2
OR				
11 (a)	Deduce the expression for electronic polarizability with the relevant sketch.	8M	20BSX33.3	L2
11 (b)	Define Ionic and Orientation polarizations.	4M	20BSX33.3	L2
12 (a)	Derive Schrodinger's time dependent wave equation. Determine the energy corresponding to the Ground state and the first excited state of an electron trapped inside a one-dimensional infinite potential well of width	10M	20BSX33.4	L2
12 (b)	1 \AA . (Note: mass of the electron, $m = 9.1 \times 10^{-31} \text{ kg}$; Planck's constant, $h = 6.62 \times 10^{-34} \text{ J-S}$).	2M	20BSX33.4	L2

OR

13 (a)	Write a note on Classical free electron theory. Discuss its merits and demerits.	10M	20BSX33.4	L2
13 (b)	Define the Fermi – Energy.	2M	20BSX33.4	L2
14 (a)	Write a detailed note on the concept of effective mass.	6M	20BSX33.5	L2
14 (b)	Discuss Bloch's theorem.	6M	20BSX33.5	L2
OR				
15 (a)	Distinguish between Conductors, Semi Conductors and Insulators based on band theory of solids.	10M	20BSX33.5	L2
15 (b)	The hall coefficient of a semiconductor is $3.66 \times 10^{-4} \text{ m}^3 \text{c}^{-1}$. Find the carrier concentration.	2M	20BSX33.5	L2

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Degree	B. Tech. (U. G.)	Program	Civil Engineering	Academic Year	2021- 2022
Course Code	20CE201	Test Duration	3 Hrs. Max. Marks 70	Semester	II
Course	BUILDING MATERIALS AND CONSTRUCTION COMPONENTS				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List out the Geological Classification of rocks.	20CE201.1	L1
2	What is fiber reinforced concrete?	20CE201.2	L1
3	Define hydration of cement	20CE201.3	L1
4	What are the functions of lintel and arches?	20CE201.4	L1
5	Classify aggregates based on size.	20CE201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Explain the causes for deterioration of stones and types preservation of stones.	12 M	20CE201.1	L2
OR				
7 (a)	Describe the requirement of good bricks and explain the manufacturing methods of bricks.	8 M	20CE201.1	L2
7 (b)	Describe the properties of class I type of bricks.	4 M	20CE201.1	L2
8	Sketch the elevation of a brick wall built in i) English bond ii) Flemish bond. iii) Compare the merits and demerits of English bond and Flemish bond.	12M	20CE201.2	L2
OR				
9 (a)	Sketch random rubble masonry in stones in elevation and section.	6M	20CE201.2	L2
9 (b)	What do you understand by mild steel bar and deformed steel bar? What are different properties of structural steel?	6M	20CE201.2	L1
10 (a)	What are the characteristics of lime?	6M	20CE201.3	L1
10 (b)	What is meant by setting time for cement? Explain the initial and final setting time.	6M	20CE201.3	L2
OR				
11	Describe briefly, with applications, (i) High early strength cement, (ii) Low alkali cement, and (iii) Rapid hardening cement	12M	20CE201.3	L2
12	With a neat sketch explain the types of stairs and what is the requirement of good stairs.	12M	20CE201.4	L2
OR				
13 (a)	Write short notes on scaffolding, shoring and underpinning.	6M	20CE201.4	L2
13 (b)	Differentiate between king post and queen post	6M	20CE201.4	L2
14	List the various tests conducted on a coarse aggregate and explain any two of them in brief.	12M	20CE201.5	L2
OR				
15 (a)	Explain the coarse and fine aggregates.	6M	20CE201.5	L2
15 (b)	Explain bulking and specific gravity on coarse aggregate.	6M	20CE201.5	L2

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Semester End Regular/Supplementary Examination, August, 2022

Degree	B. Tech. (U. G.)	Program	EEE	Academic Year	2021- 2022
Course Code	20CS403	Test Duration	3 Hrs.	Max. Marks	70
Course	PYTHON PROGRAMMING		Semester	II	

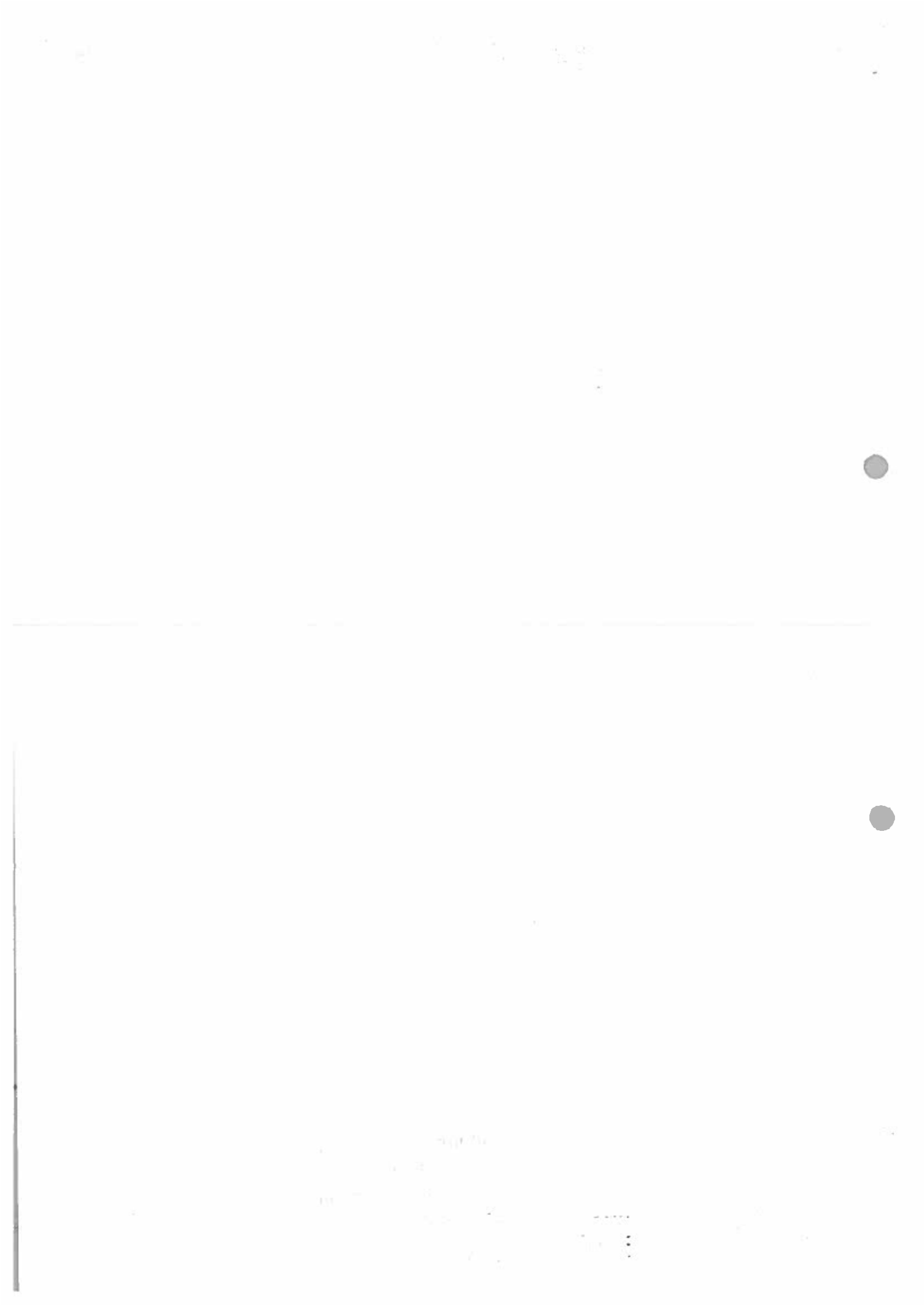
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	How variables are used in Python?	20CS403.1	L1
2	What is the use of Pass statement?	20CS403.2	L1
3	How the functions declared in the Python?	20CS403.3	L1
4	Define constructors in python	20CS403.4	L1
5	What is Graphical user Interface?	20CS403.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	How the Program Development Cycle used in Python?	4M	20CS403.1	L1
6 (b)	Explain the arithmetic and Relational operators used in the Python Programming.	8M	20CS403.1	L2
OR				
7 (a)	Discuss about Type Conversions and Expressions.	8M	20CS403.1	L2
7 (b)	Write a Python program to convert centigrade to Fahrenheit.	4M	20CS403.1	L3
8 (a)	Describe Python Break and Continue statements with examples.	6M	20CS403.2	L2
8 (b)	Write a Python program to find the given number is Armstrong Number.	6M	20CS403.2	L3
OR				
9 (a)	Explain about Strings and Number Systems in python.	4M	20CS403.2	L2
9 (b)	Discuss about List and Tuples in Python	8M	20CS403.2	L2
10 (a)	Explain about Functions as Abstraction Mechanisms.	6M	20CS403.3	L2
10 (b)	Define Function? Explain the Problem Solving with Top - Down Design	6M	20CS403.3	L2
OR				
11 (a)	Discuss in detail about the modules and explain any 4 modules and their functions.	8M	20CS403.3	L2
11 (b)	Explain installing packages via PIP.	4M	20CS403.3	L2
12 (a)	Write a Python Program on Multi-Level Inheritance.	8M	20CS403.4	L2
12 (b)	Write a Python Program on Composition. Compare Composition with Inheritance.	4M	20CS403.4	L3
OR				
13	Define file. Explain the file operations with an example program.	12M	20CS403.4	L3
14 (a)	Compare the Behavior of Terminal Based Programs and GUI - Based Programs.	4M	20CS403.5	L2
14 (b)	Explain the different methods of creating GUI with Python.	8M	20CS403.5	L2
OR				
15	Explain the following Mathematical Libraries: NumPy, matplotlib, Sympy, Pandas.	12M	20CS403.5	L2

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Degree	B. Tech. (U. G.)	Program	ECE	Academic Year	2020 - 2021
Course Code	20EC201	Test Duration	3 Hrs. Max. Marks 70	Semester	II
Course	Principles of Electronics & Communication Systems				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define drift current.	20EC201.1	L1
2	What is virtual ground?	20EC201.2	L1
3	List any two applications of FM system	20EC201.3	L1
4	Define Phase modulation.	20EC201.4	L1
5	Define critical angle.	20EC201.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Describe the terms intrinsic and extrinsic semiconductors of both P type and N type.	6M	20EC201.1	L2
6 (b)	Explain how electrons and holes are created in an extrinsic Semiconductor.	6M	20EC201.1	L2
OR				
7 (a)	Explain the distinction between metals, semiconductors and insulators with band diagrams.	6M	20CS403.1	L2
7 (b)	State and explain the Hall Effect. Mention its applications.	6M	20CS403.1	L2
8 (a)	Draw the block schematic of an op-amp and briefly explain each block.	6M	20EC201.2	L2
8 (b)	Obtain the gain expression for ideal inverting amplifier.	6M	20EC201.2	L2
OR				
9 (a)	Derive the gain of closed loop differential OP-AMP.	6M	20EC201.2	L2
9 (b)	Obtain the output voltage adder circuit.	6M	20EC201.2	L2
10 (a)	List and state all the elementary continuous time signals.	6M	20EC201.3	L1
10 (b)	Compare continuous and discrete time signals.	6M	20EC201.3	L2
OR				
11 (a)	What is amplitude modulation and write its mathematical expression with neat diagrams.	6M	20EC201.3	L2
11 (b)	List any 6 applications of AM system.	6M	20EC201.3	L1
12 (a)	Explain natural Sampling and Flat-top Sampling	6M	20EC201.4	L2
12 (b)	With a neat sketch, explain the principle and operation of DPCM.	6M	20EC201.4	L2
OR				
13 (a)	Compare PAM, PPM and PWM with signal diagrams.	6M	20EC201.4	L2
13 (b)	Explain the Digital modulation scheme.	6M	20EC201.4	L2
14 (a)	Draw and explain the working principle of an Optical Communication system.	6M	20ESX02.5	L2
14 (b)	Explain the basic elements of optical communication system.	6M	20ESX02.5	L2
OR				
15 (a)	Explain the properties of light and ray theory.	6M	20EC201.5	L2
15 (b)	Explain the basic elements of cellular communication systems.	6M	20EC201.6	L2

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Degree	B. Tech. (U. G.)	Program	CSE, CSM & CSD			Academic Year	2021 - 2022
Course Code	20EC203	Test Duration	3 Hrs.	Max. Marks	70	Semester	II
Course	Digital logic Design						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Convert the following binary number into its equivalent gray code: 11010101	20EC203.1	L1
2	Convert the following gray code into its binary: 10101110	20EC203.2	L1
3	What is the purpose of decoder?	20EC203.3	L2
4	What is meant by race around condition? How can it be avoided?	20EC203.4	L2
5	What is meant by programmable logic devices?	20EC203.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	With examples, explain the significance of Octal number system and Hexadecimal number system in digital circuit designs.	6M	20EC203.1	L2
6 (b)	Perform each of the following conversions: a) (473) ₁₀ in to BCD code b) BAD in to ASCII c) (289) ₁₀ in to hexadecimal d) (110011.110) ₂ in to decimal e) (53) ₈ in to hexadecimal	6M	20EC203.1	L2
OR				
7 (a)	Perform arithmetic operation using 2's complement method. a) -70 - 85 b) 130 - 65	6M	20EC203.1	L2
7 (b)	With examples, explain the conversion of a gray code to corresponding binary code sequence and vice-versa	6M	20EC203.1	L2
8 (a)	Find the standard sum of products (SOP) for the logic expression: $F(A, B, C, D) = \overline{A}B + AB\overline{D} + BCD$	6M	20EC203.2	L3
8 (b)	Use K-map to minimize the expression: $F(A, B, C, D) = \sum m(0, 1, 2, 3, 4, 9, 10, 12, 13, 14, 15)$	6M	20EC203.2	L3
OR				
9 (a)	Reduce the expression $f = \pi M(0, 1, 2, 3, 4, 7)$ using K-maps and implement it using NOR logic	6M	20EC203.2	L3
9 (b)	Reduce the following function $f(A, B, C) = \sum m(0, 1, 3, 5, 7)$ and Draw the logi circuit	6M	20EC203.2	L3
10 (a)	Design a Excess-3 Adder Circuit	6M	20EC203.3	L3
10 (b)	Design the logic circuit for a BCD to decimal decoder	6M	20EC203.3	L3
OR				
11 (a)	Differentiate Multiplexer and De-multiplexer. With simple examples, explain how they are implemented.	6M	20EC203.3	L3
11 (b)	Design a Full Adder Using Two Half Adder	6M	20EC203.3	L3

12 (a)	Implement the following function using PROM $P(W,X,Y,Z) = \sum m(0,1,2,3,4,7,8,9,12,15)$ and $Q(W,X,Y,Z) = \sum m(5,6,9,10,11,13)$.	6M	20EC203.4	L3
12 (b)	Implement PLA for the following $F_1 = \sum m(0,1,2,4)$ and $F_2 = \sum m(0,5,6,7)$	6M	20EC203.4	L3
OR				
13 (a)	Compare PAL, PLA and FPGA	6M	20EC203.4	L3
13 (b)	Compare static RAM and dynamic RAM	6M	20EC203.4	L3
14	Explain in detail about SR Latch using NOR	12M	20EC203.5	L2
OR				
15	Explain in detail about JK Flip Flop	12M	20EC203.5	L2

G. Kalyani
Controller of Examinations
NSRIT (A)
Visakhapatnam

Semester End Regular/Supplementary Examination, August, 2022

Degree	B. Tech. (U. G.)	Program	EEE	Academic Year	2021 - 2022
Course Code	20ESX01	Test Duration	3 Hrs. Max. Marks	70	Semester II
Course	ENGINEERING DRAWING				

Part A (Short Answer Questions 2 x 5 = 10 Marks)

No.	Questions (1 through 2)	Learning Outcome (s)	DoK
1	Draw a parabola having 65 mm base and 110 mm axis using rectangular method.	20ESX01.2	L2
2	A thin circular plate of 90 mm diameter is resting on its circumference such that its plane is inclined 35° to the H.P. Draw the projections of the plate.	20ESX01.3	L3

Part B (Long Answer Questions 5 x 12 = 60 Marks)

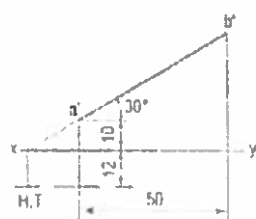
No.	Questions (3 through 12)	Marks	Learning Outcome (s)	DoK
3 (a)	Construct an ellipse when the distance of focus from the directrix is 60 mm, eccentricity is 2/3. Draw a normal and tangent to the curve at a point 50 mm from the directrix.	8M	20ESX01.1	L3
3 (b)	Define first angle projection and draw the projections of the conventional indicator/symbol for first angle projection with complete dimensions.	4M	20ESX01.1	L2

OR

4 (a)	Construct a scale of R.F. = 1/84480 to show miles and furlongs and long enough to measure upto 8 miles.	6M	20ESX01.1	L2
4 (b)	The area of a field is 50,000 sq m. The length and the breadth of the field, on the map is 12 cm and 10 cm respectively. Construct a diagonal scale which can read upto one metre. Mark the length of 245 metre on the scale. What is the R.F. of the scale?	6M	20ESX01.1	L3
5 (a)	A line AB, inclined at 40° to the V.P., has its ends 50 mm and 30 mm above the H.P. The length of its front view is 65 mm and is 15 mm above the H.P. Determine the true length of AB, its inclination with the H.P.	4M	20ESX01.2	L2
5 (b)	A point P is 25 mm above the H.P. and 30 mm in front of the V.P. Another point Q is 15 mm behind the V.P. and 30 mm below the H.P. Draw projections of P and Q keeping the distance between their projectors equal to 100 mm. Draw straight lines joining (i) their top views and (ii) their front views.	8M	20ESX01.2	L3

OR

6 (a)	A point P is in the first quadrant. Its shortest distance from the intersection point of H.P., V.P. and Auxiliary vertical plane, perpendicular to the H.P. and V.P. is 60 mm and it is equidistant from principal planes (H.P. and V.P.). Draw the projections of the point and determine its distance from the H.P. and V.P. The front view a'b' and the H.T. of a line AB, inclined at 28° to the H.P. are given in figure. Determine the true length of AB, its inclination with the V.P. and its V.T.	6M	20ESX01.2	L2
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6 (b)		6M	20ESX01.2	L3
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Semester End Regular Examination, June, 2022

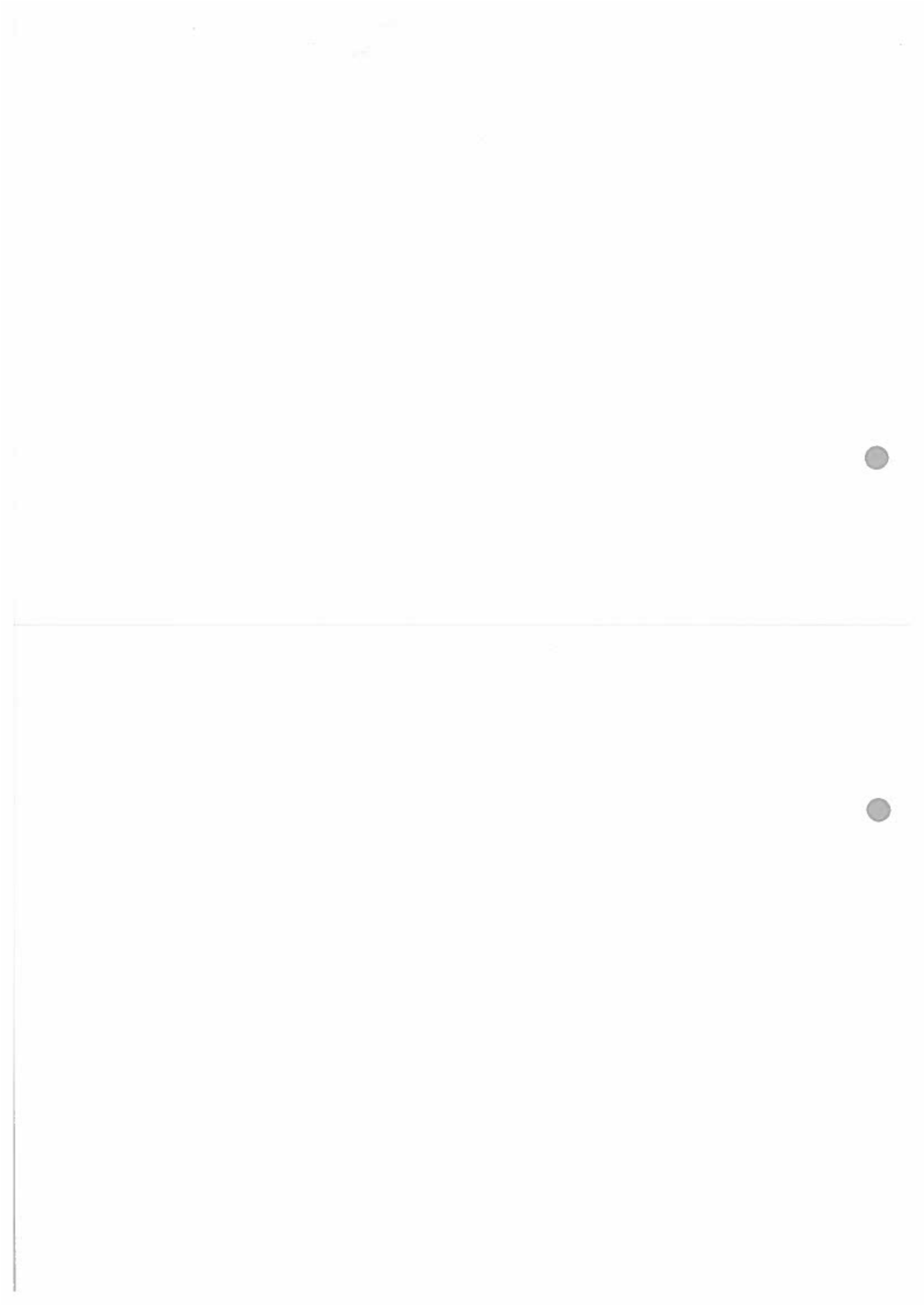
Degree	B. Tech. (U. G.)	Program	CSE (Honors)	Academic Year	2021 - 2022
Course Code	20CSH01	Test Duration	3 Hrs. Max. Marks	Semester	IV
Course	Advanced Computer Architecture				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Amdahl's law.	20CSH01.1	L1
2	Outline the basic structure of memory hierarchy.	20CSH01.2	L2
3	Distinguish pipelining from parallelism.	20CSH01.3	L2
4	Classify the vector instruction types.	20CSH01.4	L2
5	What is operand forwarding?	20CSH01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Discuss in detail about the SIMD and multi vector systems.	12M	20CSH01.1	L1
OR				
7	Explain the difficulties faced by parallel processing programs.	12M	20CSH01.1	L1
8	Discuss in detail about the memory hierarchy technologies with necessary illustrations.	12M	20CSH01.2	L2
OR				
9 (a)	Explain the virtual memory address translation and TLB with necessary diagram.	6M	20CSH01.2	L2
9 (b)	Examine the concept of paging and segmentation.	6M	20CSH01.2	L2
10	What is dynamic scheduling and compare how it is different from static pipeline scheduling.	12M	20CSH01.3	L2
OR				
11	Explain in detail about the pipelining and super scalar techniques with necessary illustrations.	12M	20CSH01.3	L2
12	Discuss the steps involved in the address translation of virtual memory with necessary illustrations.	12M	20CSH01.4	L2
OR				
13 (a)	Explain Multicore architecture of computers.	6M	20CSH01.4	L2
13 (b)	Explain the three generations of multi computers.	6M	20CSH01.4	L2
14	Discuss in detail about the instruction level parallelism.	12M	20CSH01.5	L2
OR				
15	Illustrate the following			
	i. Operand Forwarding	12M	20CSH01.5	L2
	ii. Branch Prediction			



Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	Common to All (Minor)	Academic Year	2021 - 2022
Course Code	20AIM01	Test Duration	3 Hrs. Max. Marks	Semester	IV
Course	Fundamentals of Neural Networks				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Compare biological neuron with artificial neuron.	20AIM01.1	L2
2	Distinguish between supervised and unsupervised learning.	20AIM01.2	L2
3	What is perceptron?	20AIM01.3	L1
4	Identify the role of neuron in multilayer neural network.	20AIM01.4	L3
5	List out any four applications of BPN.	20AIM01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Write the various benefits of neural networks. Explain the benefits of neural networks.	12M	20AIM01.1	L2
OR				
7	Describe McCulloch-Pitts neuron model.	12M	20AIM01.1	L2
8	Explain how weights are adjusted in the different types of learning law. (Both supervised and unsupervised learning).	12M	20AIM01.2	L2
OR				
9 (a)	Write the differences between conventional computer program and ANN.	6M	20AIM01.2	L2
9 (b)	List the advantages and disadvantages of Artificial Neural Networks.	6M	20AIM01.2	L2
10	Describe perceptron learning rule and delta learning rule.	12M	20AIM01.3	L2
OR				
11	Elaborate the various learning processes used in the neural networks.	12M	20AIM01.3	L2
12	What is Multi-layer feed forward networks? What is the importance of hidden and output layers in it?	12M	20AIM01.4	L1
OR				
13 (a)	Explain the steps involved in the back propagation algorithm.	6M	20AIM01.4	L1
13 (b)	What are the pattern recognition tasks that can be performed by back propagation network?	6M	20AIM01.4	L1
14	Explain Hebbian learning with necessary illustrations.	12M	20AIM01.5	L2
OR				
15	Explain the architecture and function of Bidirectional Associative memory (BAM).	12M	20AIM01.5	L2



Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	CSE (AI & ML & DS) - Honors	Academic Year	2021 - 2022
Course Code	20DSH01	Test Duration	3 Hrs.	Max. Marks	70
Course	Text Analytics			Semester	IV

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is natural language processing?	20DSH01.1	L1
2	List the applications of multi class classification system.	20DSH01.2	L1
3	Recall latent Dirichlet allocation.	20DSH01.3	L1
4	Compare Manhattan and Euclidean distance.	20DSH01.4	L2
5	Distinguish between supervised and unsupervised learning.	20DSH01.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Interpret the language syntax and structure in natural language.	6M	20DSH01.1	L2
6 (b)	Illustrate language semantics with suitable example.	6M	20DSH01.1	L2
OR				
7 (a)	Explain first order logic with an example.	6M	20DSH01.1	L2
7 (b)	Summarize the steps involved in text categorization and text analytics.	6M	20DSH01.1	L2
8 (a)	Analyze support vector machine for automated text classification.	6M	20DSH01.2	L3
8 (b)	Explain the text classification with building process of automated text classification.	6M	20DSH01.2	L3
OR				
9 (a)	Interpret TF-IDF mode in text classification.	6M	20DSH01.2	L3
9 (b)	Compare the performance and features of dependency based parsing and constituency based parsing.	6M	20DSH01.2	L3
10 (a)	What is text normalization? List the features to be extracted for text normalization.	6M	20DSH01.3	L2
10 (b)	Illustrate weighted tag based phrase extraction with an example.	6M	20DSH01.3	L2
OR				
11 (a)	Explain the process of automated document summarization.	6M	20DSH01.3	L2
11 (b)	Explain unsupervised learning techniques in text summarization.	6M	20DSH01.3	L2
OR				
12 (a)	Elaborate the process of feature extraction in text summarization.	6M	20DSH01.4	L3
12 (b)	Compare the performance of the Manhattan and Euclidean distance similarity measures.	6M	20DSH01.4	L3
OR				
13 (a)	Analyze K-means clustering algorithm for document clustering using suitable dataset.	6M	20DSH01.4	L3
13 (b)	Explain about Ward's agglomerative hierarchical clustering with suitable dataset.	6M	20DSH01.4	L3
14 (a)	Analyze lexical semantic relations with necessary illustrations.	6M	20DSH01.5	L3
14 (b)	Distinguish between first order and propositional logics for semantic analysis.	6M	20DSH01.5	L3
OR				
15 (a)	Examine named entity recognition for semantic analysis.	6M	20DSH01.5	L3
15 (b)	Compare the performance of unsupervised sentiment analysis models.	6M	20DSH01.5	L3



Semester End Regular Examination, June , 2022

Degree	B. Tech. (U. G.)	Program	ECE (Honors)	Academic Year	2021 - 2022
Course Code	20ECH01	Test Duration	3 Hrs. Max. Marks	70	Semester
Course	Low Power VLSI Design				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Give the need for Low Power design in VLSI systems?	20ECH01.1	L1
2	What is Constant voltage scaling?	20ECH01.2	L1
3	Differentiate static power and Dynamic Power in VLSI circuits?	20ECH01.3	L1
4	Draw the carry equation of adder using CMOS logic?	20ECH01.4	L3
5	List the different multiplier architectures?	20ECH01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What is switching power dissipation? Explain it with a CMOS Inverter.	8M	20ECH01.1	L2
6 (b)	Define short circuit Power dissipation.	4M	20ECH01.1	L2
OR				
7	Explain the leakage and glitching power dissipation in a CMOS inverter.	12M	20ECH01.1	L2
8	Explain the MT CMOS technique.	12M	20ECH01.2	L2
OR				
9	Explain the role of parallel and pipeline processing in Architectural low power design.	12M	20ECH01.2	L2
10	Discuss the various power reduction techniques used in Gate level design.	12M	20ECH01.3	L2
OR				
11 (a)	Explain the types of Parasitic capacitance in detail.	10M	20ECH01.3	L2
11 (b)	Give the formulae for capacitive power dissipation.	2M	20ECH01.3	L2
12	Compare Ripple carry Adder and Carry look ahead adder for a 4 bit input.	12M	20ECH01.4	L2
OR				
13	Draw the architecture of 16 bit Carry select Adder and explain the reasons for its low power consumption when compared to other Adders.	12M	20ECH01.4	L2
14	Explain the working of Braun Multiplier with its structure.	12M	20ECH01.5	L2
OR				
15	Explain about the Booth Multiplier and draw its VLSI Structure.	12M	20ECH01.5	L2



Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	EEE (Honors)	Academic Year	2021 - 2022
Course Code	20EEH01	Test Duration	3 Hrs. Max. Marks	70	Semester
Course	Smart Grid				IV

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define the term smart grid and mention its components.	20EEH01.1	L1
2	Indicate the role of SCADA in smart grid.	20EEH01.2	L2
3	Identify the features of smart substation.	20EEH01.3	L2
4	List any two components of AMI used in smart grid.	20EEH01.4	L1
5	Define the term cloud computing and its need in smart grid operation.	20EEH01.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Describe the different opportunities and Barriers of Smart Grid in India.	12M	20EEH01.1	L2
OR				
7 (a)	Compare the features of conventional & Smart grid technologies.	8M	20EEH01.1	L2
7 (b)	Explain the challenges and issues of smart grid implementation.	4M	20EEH01.1	L2
8	Describe the substation automation system involved in smart grid.	12M	20EEH01.2	L2
OR				
9	Describe the power quality issues of grid connected renewable energy sources and solutions.	12M	20EEH01.2	L2
10	Explain the Outage Management System (OMS) used in the distribution networks.	12M	20EEH01.3	L2
OR				
11	Describe the concept of distribution management system.	12M	20EEH01.3	L2
12	Compare the role of conventional metering and smart metering while involved in demand side management applications.	12M	20EEH01.4	L2
OR				
13	Describe the concept of Advanced Metering infrastructure (AMI) in smart grid.	12M	20EEH01.4	L2
14	Explain the important role of Local Area Network and PLC in the smart grid systems.	12M	20EEH01.5	L2
OR				
15 (a)	Illustrate the role of Broadband over power line (BPL) in the Sma grid operation.	8M	20EEH01.5	L2
15 (b)	Explain the important features of house area network (HAN) used in smart grid.	4M	20EEH01.5	L2

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Semester End Regular Examination, June, 2022

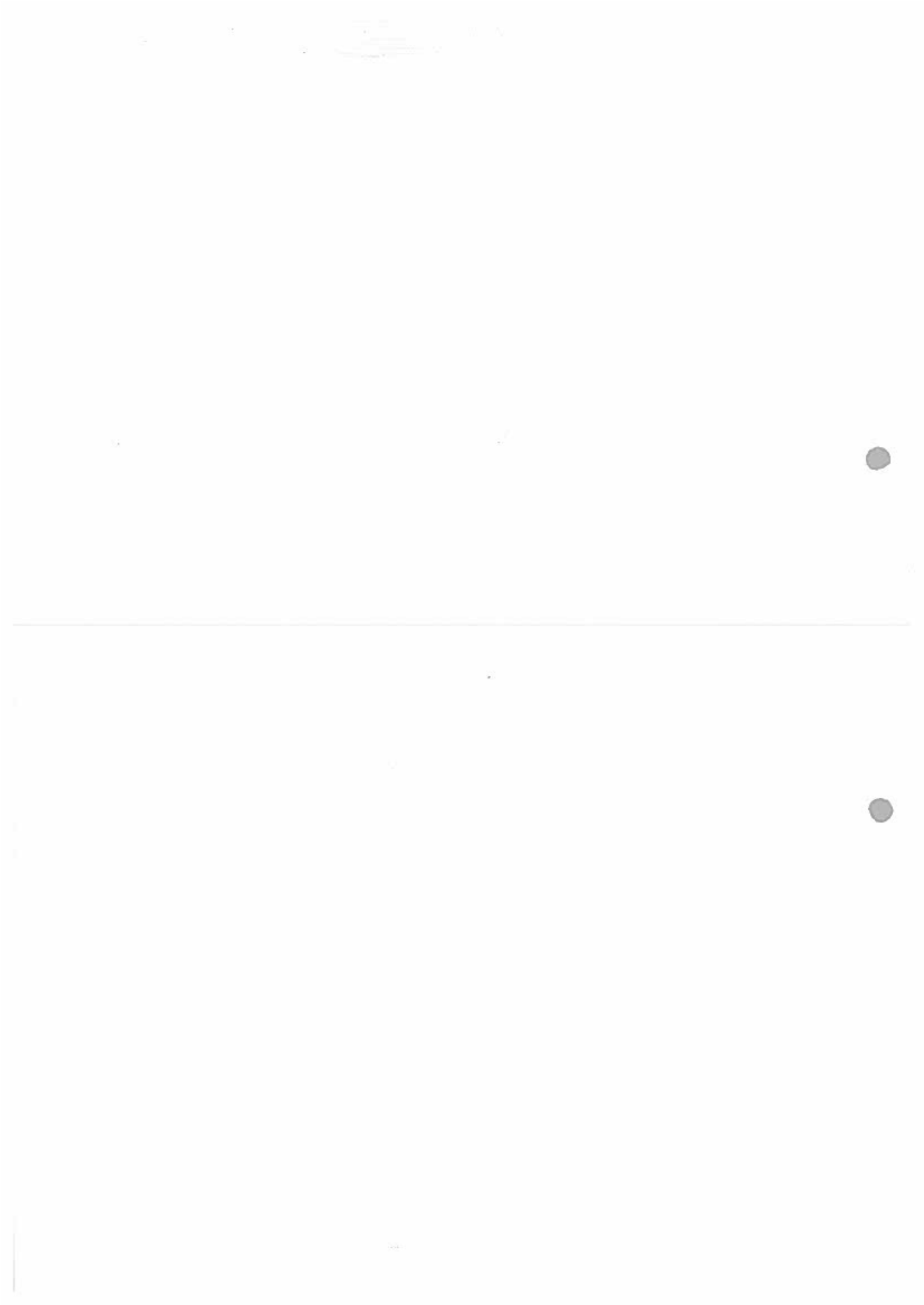
Degree	B. Tech. (U. G.)	Program	Civil Engineering (Honors)	Academic Year	2021 - 2022
Course Code	20CEH02	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Energy Efficient Buildings				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Classify the different types of Energy Sources.	20CEH02.1	L1
2	Define the term "Green House Effect".	20CEH02.2	L1
3	Differentiate between active and passive solar building.	20CEH02.3	L1
4	Interpret the importance of Green cover.	20CEH02.4	L1
5	List out the different classes of biopolymers.	20CEH02.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Write about non-conventional energy sources.	6M	20CEH02.1	L2
6 (b)	Describe the need for Energy Conservation system.	6M	20CEH02.1	L2
OR				
7 (a)	Explain the classification of quality and concentration of energy from various energy sources.	6M	20CEH02.1	L2
7 (b)	Outline the various forms of energy and energy scenario in India.	6M	20CEH02.1	L2
8 (a)	Outline the concepts involved in Green Energy systems.	6M	20CEH02.2	L2
8 (b)	Comment on various rating systems for the assessment of sustainability.	6M	20CEH02.2	L2
OR				
9 (a)	Explain the impacts of greenhouse gas emission process.	6M	20CEH02.2	L2
9 (b)	Enumerate the adoptive process and the agreements related to energy and sustainability.	6M	20CEH02.2	L2
10 (a)	Explain in detail the different ways of Utilization of Solar energy in buildings.	6M	20CEH02.3	L2
10 (b)	Elucidate the role of designing buildings related to the climatic conditions.	6M	20CEH02.3	L2
OR				
11 (a)	Elucidate the ways of water Utilization in Buildings through natural sources.	6M	20CEH02.3	L2
11 (b)	Describe the differences of passive cooling and heating process in buildings.	6M	20CEH02.3	L2
12 (a)	Explain in brief about the techniques adopted for the management of Sullage Water and Sewage water for better sustainability.	6M	20CEH02.4	L2
12 (b)	Explain the guidelines and techniques related to green belt development.	6M	20CEH02.4	L2
OR				
13 (a)	Write a note on water recycling and energy conservation.	6M	20CEH02.4	L2
13 (b)	Enumerate the importance of energy Approaches to Water Management.	6M	20CEH02.4	L2
14 (a)	Explain the techniques involved in preparation of Nano particles.	6M	20CEH02.5	L2
14 (b)	Enumerate the importance of Bio nanocomposites for sustainable future.	6M	20CEH02.5	L2
OR				
15 (a)	Explain the sources and preparation of biopolymers.	6M	20CEH02.5	L2
15 (b)	Elucidate the concept of hybrid systems of thermal comfort. State	6M	20CEH02.5	L2



Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	Common To All			Academic Year	2021 - 2022
Course Code	20HSX03	Test Duration	3 Hrs.	Max. Marks	70	Semester	IV
Course	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS						

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is the definition of managerial economics?	20HSX03.1	L1
2	Define Angle of incidence.	20HSX03.2	L1
3	Write the proforma of journal entry.	20HSX03.1	L1
4	What is Pay Back Period?	20HSX03.4	L1
5	Write the formula of current ratio.	20HSX03.1	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	How do you link managerial economics with other disciplines/subjects?	6M	20HSX03.1	L2
6 (b)	Define elasticity of demand and explain different types of elasticity of demand.	6M	20HSX03.1	L2
OR				
7 (a)	What is demand? Explain the different types of demand.	6M	20HSX03.1	L2
7 (b)	What do you mean by demand forecasting? Explain various demand forecasting methods.	6M	20HSX03.1	L2
8(a)	Explain the production function with one variable.	6M	20HSX03.2	L2
8 (b)	What is break even analysis? How do you determine breakeven point? Illustrate.	6M	20HSX03.2	L2
OR				
9 (a)	Explain Cobb Douglas Production function.	4M	20HSX03.2	L2
9 (b)	You are required to calculate i) Margin of Safety ii) Total sales iii) Variable cost iv) Fixed costs Rs. 12,000, Profit Rs. 1,000, Break-Even Sales Rs.60,000	8M	20HSX03.2	L3

10 (a)	Particulars	Rs.	Particulars	Rs.	6M	20HSX03.3	L3
	Opening stock	1,250	Plant and machinery	6,230			
	Sale	11,800	Returns outwards	1,380			
	Depreciation	667	Cash in hand	942			
	Commission (Cr).	211	Salaries	750			
	Insurance	380	Debtors	1,905			
	Carriage inwards	300	Discount (Dr.)	328			
	Furniture	670	Bills receivable	2,730			
	Printing charges	481	Wages	1,589			
	Carriage outwards	200	Return inwards	1,659			
	Capital	9,228	Bank overdraft	4,000			
	Creditors	1,780	Purchases	8,679			
	Bills payable	541	Bad debts	180			

	The above balances extracted from the books of mythji & company, prepare a trading, profit and loss account and a balance sheet. The value of stock on 31 st December, 1990 was Rs. 3,700.																							
10 (b)	Write about short note on trading account and profit and loss account.	6M	20HSX03.3	L2																				
OR																								
11 (a)	Explain the concepts of journal and ledger accounts with performa.	6M	20HSX03.3	L2																				
11 (b)	Journalizing the following transactions: Jan 1 Started business with cash Rs.100,000 2 Deposited Rs.75,000 to bank 3 Purchased furniture Rs.20,000 and paid by cheque (Through Bank) 5 Paid shop rent Rs.2,500 cash 7 withdrew from bank for personal use Rs.1,000 8 Sold goods on credit Rs.6,000 to Jithesh 10 Received interest from bank Rs.600	6M	20HSX03.3	L3																				
12 (a)	What do you mean by payback period method? Explain the merits and demerits of payback period method.	6M	20HSX03.4	L2																				
12 (b)	Solve the payback period of the following projects each requiring a cash outlay of Rs 1,00,000 each.	6M	20HSX03.3	L3																				
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Year</th> <th colspan="2">Cash Inflows Rs.</th> </tr> <tr> <th>Project A</th> <th>Project B</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>30,000</td> <td>30,000</td> </tr> <tr> <td>2</td> <td>30,000</td> <td>40,000</td> </tr> <tr> <td>3</td> <td>30,000</td> <td>20,000</td> </tr> <tr> <td>4</td> <td>30,000</td> <td>25,000</td> </tr> <tr> <td>5</td> <td>30,000</td> <td>5,000</td> </tr> </tbody> </table>	Year	Cash Inflows Rs.		Project A	Project B	1	30,000	30,000	2	30,000	40,000	3	30,000	20,000	4	30,000	25,000	5	30,000	5,000			
Year	Cash Inflows Rs.																							
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1	30,000	30,000																						
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3	30,000	20,000																						
4	30,000	25,000																						
5	30,000	5,000																						
OR																								
13 (a)	What is capital? Explain the types and significance.	6M	20HSX03.4	L2																				
13 (b)	Find the net present value at the rate of 10% per annum from the following data related to CNC machines 1 and 2. The estimated cash flows after taxes for each machine are as given below.	6M	20HSX03.4	L2																				
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Year</th> <th>CNC Machine 1</th> <th>CNC Machine 2</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1,50,000</td> <td>2,00,000</td> </tr> <tr> <td>2</td> <td>3,00,000</td> <td>3,00,000</td> </tr> <tr> <td>3</td> <td>1,50,000</td> <td>2,50,000</td> </tr> <tr> <td>4</td> <td></td> <td>1,50,000</td> </tr> <tr> <td>Total</td> <td>6,00,000</td> <td>6,00,000</td> </tr> </tbody> </table> <p>Investment is 3,00,000 in each project</p>	Year	CNC Machine 1	CNC Machine 2	1	1,50,000	2,00,000	2	3,00,000	3,00,000	3	1,50,000	2,50,000	4		1,50,000	Total	6,00,000	6,00,000					
Year	CNC Machine 1	CNC Machine 2																						
1	1,50,000	2,00,000																						
2	3,00,000	3,00,000																						
3	1,50,000	2,50,000																						
4		1,50,000																						
Total	6,00,000	6,00,000																						

14 (a)	From the following information, solve			6M	20HSX03.5	L3	
	i. Debt-Equity ratio						
	ii. Current ratio						
	iii. Quick ratio						
	Liabilities	Rs.	Assests				Rs.
	Debentures	1,40,000	Bank balance				30,000
	Long term Loans	70,000	Sundry Debtors				70,000
General reserve	40,000						
Creditors	66,000						
Bills payable	14,000						
Share capital	1,20,000						
14 (b)	What do you mean by accounting ratios? How are they useful?			6M	20HSX03.5	L2	
OR							
15 (a)	Solve interest coverage ratio from the following information			6M	20HSX03.5	L3	
	Particulars		Rs.				
	Net profit after deducting interest and taxes		6,00,000				
	12% Debentures of the face value of		15,00,000				
Amount provided towards taxation		1,20,000					
15 (b)	Explain the various profitability ratios and explain the meaning and method calculation of these methods.			6M	20HSX03.5	L2	

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11/10/20

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	CE	Academic Year	2021 - 2022
Course Code	20CE402	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	HYDRAULICS & HYDRAULIC MACHINERY				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What is the condition for Reynold's Number for the case of laminar flow in open channels	20CE405.1	L1
2	What are the different dimensionless numbers?	20CE405.2	L2
3	A jet of water strikes with a velocity of 40 m/s a flat plate inclined at 300 with the axis of the jet. If the cross sectional area of the jet is 25 cm ² determine the force exerted by the jet on the plate.	20CE405.3	L2
4	Classify different types of turbines according to discharge.	20CE405.4	L2
5	What are various components of reciprocating pump?	20CE405.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Describe the different types of flow in open channels	12M	20CE405.1	L2
OR				
7 (a)	Determine the economical cross-section for an open channel of trapezoidal section with side slopes of 1 vertical to 2 horizontal, to carry 10 m ³ /s, the bed slope being 1/2000. Assume Manning coefficient as 0.022.	8M	20CE405.1	L2
7 (b)	Differentiate between uniform and non uniform flow.	4M	20CE405.1	L2
8 (a)	What are similarities between model and prototype?	4M	20CE405.2	L3
8 (b)	A spillway model is constructed on a scale of 1:25. Calculate (i) the prototype discharge corresponding to model discharge of 0.12 m ³ /sec (ii) the velocity in model corresponding to prototype velocity of 3.5 m/s.	8M	20CE405.2	L3
OR				
9 (a)	Write in detail about Geometric, Kinematic and Dynamic Similarities.	6M	20CE405.2	L3
9 (b)	What do you mean by dimensionless numbers? Name any four dimensionless numbers. Define and explain Reynolds's number and Froude's number.	6M	20CE405.2	L3
10 (a)	A jet of water 50 mm in diameter and moving with a velocity of 26 m/s is impinging normally on a plate. Determine the pressure on the plate when it is fixed and when it is moving with a velocity of 10 m/s in the direction of the jet. Also determine the work done per second by the jet.	10M	20CE405.3	L3
10 (b)	A jet of water strikes with a velocity of 40 m/s a flat plate inclined at 300 with the axis of the jet. If the cross sectional area of the jet is 25 cm ² determine the force exerted by the jet on the plate.	5M	20CE405.3	L3
OR				
11 (a)	A jet of water of 60 mm diameter strikes a curved vane at its centre with a velocity of 18 m/s. The curved vane is moving with a velocity of 6 m/s in the direction of the jet. The jet is deflected through an angle of 165°. Assuming the plate to be smooth find: (i) Thrust on the plate in the direction of jet, (ii) Power of the jet, and (iii) Efficiency of the jet.	6M	20CE405.3	L3
11 (b)	Explain about Angular momentum principle.	6M	20CE405.3	L3
12	Write in detail about a hydropower installation	12M	20CE405.4	L2
OR				
13 (a)	A pelton wheel has to be designed for the following data: power to be developed = 6000 kW, Net head available = 400 m, speed = 550 rpm, Ratio of jet diameter to the wheel diameter = 1/10 and overall efficiency = 85%. Find the number of jets, diameter of jet, diameter of the wheel and quantity of water required.	8M	20CE405.4	L2
13 (b)	Write short note on Francis turbine.	4M	20CE405.4	L2

14 (a)	Define centrifugal pump and explain the working procedure of a single-stage centrifugal pump with neat sketch.	7M	20CE405.5	L3
14 (b)	A centrifugal pump rotating at 1080 rpm delivers 168 liters/s of water against a head of 30 m. The pump is installed at a place where atmospheric pressure is 1×10^5 Pa(abs.) and vapour pressure of water is 2 kPa (abs.). The head loss in suction pipe is equivalent to 0.2 m of water. Calculate minimum NPSH.	5M	20CE405.5	L3
OR				
15 (a)	Write in detail about Kaplan turbine.	8M	20CE405.5	L3
15 (b)	Write about cavitation in pumps.	4M	20CE405.5	L3

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	Mechanical Engg. / CSE	Academic Year	2021 - 2022
Course Code	20CS403	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Python Programming				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Represent Python Program Development Cycle.	20CS403.1	L1
2	Develop a code to print "NSRIT" 5 times.	20CS403.2	L2
3	List any four machine learning libraries that can be installed using PIP.	20CS403.3	L1
4	Distinguish between class and object.	20CS403.4	L2
5	Write the function of Matplotlib and GNUplot.	20CS403.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain any three keywords with an example.	6M	20CS403.1	L2
6 (b)	(i) Develop a code using rawinput () function to read the input from keyboard. (ii) Develop a code to output multiple variables using "+" operator.	6M	20CS403.1	L3
OR				
7 (a)	Develop a python code to perform arithmetic operations. Note: (i) Use input () function to get user input (ii) format () function to format the string and print the result with statements.	6M	20CS403.1	L3
7 (b)	Explain the logical operators with an example.	6M	20CS403.1	L2
8 (a)	Develop the python code to find perimeter of square. Develop the python code to print the numbers in following pattern.	6M	20CS403.2	L3
8 (b)	2 4 6 8 10 12 14 16 18 20	6M	20CS403.2	L3
OR				
9 (a)	Develop the python code to input any alphabet and check whether it is vowel or not.	6M	20CS403.2	L3
9 (b)	Distinguish between the list and tuples in terms of methods, iteration and memory consumption.	6M	20CS403.2	L2
10 (a)	Develop the python code to find maximum and minimum between two numbers using functions	6M	20CS403.3	L3
10 (b)	Explain any three functions of module with an example.	6M	20CS403.3	L2
OR				
11 (a)	Develop the python code accepts roll number and returns whether the student is present or absent.	4M	20CS403.3	L3
11 (b)	Interpret the Math module with an example.	8M	20CS403.3	L2

12 (a)	Interpret the different functions of file with an example.	6M	20CS403.4	L2
12 (b)	Explain how to create a constructor in Python? Give an example.	6M	20CS403.4	L2
OR				
13(a)	Develop the python code to depict multiple inheritance.	6M	20CS403.4	L3
13(b)	Explain the operator overloading in Python with example.	6M	20CS403.4	L2
OR				
14	Explain the following terms: (i)Types of Variables in Scratch (ii)Use of Variable in Scratch	12M	20CS403.5	L2
OR				
15	Explain the following terms: (i) tkinter module in Python GUI. (ii) Explain any 6 functions in NumPy with example.	12M	20CS403.5	L2

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	EEE/CSM/CSD	Academic Year	2021 - 2022
Course Code	20BSX15	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Probability and Statistics				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Course Outcomes	DoK
1	Find the median of the marks of students in a class 60, 72, 96, 28, 35, 10, 40, 09, 85, 25	20BSX15.1	L2
2	Out of 800 families with 5 children each, how many families would be expected to have 3 boys? Assume equal probabilities for boys and girls	20BSX15.2	L3
3	Define the Sampling distribution of a statistic.	20BSX15.3	L2
4	Write the test statistic to test to the difference of two means in small samples.	20BSX15.4	L1
5	What is the difference between positive and negative correlation?	20BSX15.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Course Outcomes	DoK													
6 (a)	Calculate the Arithmetic mean and Standard deviation of the following continuous frequency distribution	8	20BSX15.1	L2													
	<table border="1"> <thead> <tr> <th>Class Interval</th> <th>20-30</th> <th>30-40</th> <th>40-50</th> <th>50-60</th> <th>60-70</th> <th>70-80</th> <th>80-90</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>3</td> <td>61</td> <td>132</td> <td>153</td> <td>140</td> <td>51</td> <td>2</td> </tr> </tbody> </table>				Class Interval	20-30	30-40	40-50	50-60	60-70	70-80	80-90	Frequency	3	61	132	153
Class Interval	20-30	30-40	40-50	50-60	60-70	70-80	80-90										
Frequency	3	61	132	153	140	51	2										
6 (b)	Find the Coefficient of Variation of the following data 3,8,6,10,12,9,11,10,12,7	4	20BSX15.1	L2													

OR

7	Calculate the Karl Pearson's coefficient of Skewness for the following data	12	20BSX15.1	L2													
	<table border="1"> <thead> <tr> <th>Variable</th> <th>0-10</th> <th>10-20</th> <th>20-30</th> <th>30-40</th> <th>40-50</th> <th>50-60</th> <th>60-70</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>5</td> <td>6</td> <td>11</td> <td>21</td> <td>35</td> <td>30</td> <td>22</td> </tr> </tbody> </table>				Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Frequency	5	6	11	21
Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70										
Frequency	5	6	11	21	35	30	22										
8 (a)	State and Prove Baye's Theorem.	6	20BSX15.2	L2													
8(b)	The probabilities of X, Y, Z becoming managers are $\frac{4}{9}, \frac{2}{9}$ and $\frac{1}{3}$ respectively. The probabilities that the bonus scheme will be introduced if X, Y and Z becomes managers are $\frac{3}{10}, \frac{1}{2}$ and $\frac{4}{5}$ respectively. What is the probability that (i) The bonus scheme will be introduced (ii) If the bonus scheme has been introduced, what is the probability that the manager appointed was Y?	6	20BSX15.2	L3													

OR

9 (a)	A continuous random variable X has the distribution function	6	20BSX15.2	L3
	$F(x) = \begin{cases} 0, & \text{if } x \leq 1 \\ k(x-1)^3 & \text{if } 1 < x \leq 3 \\ 1 & \text{if } x > 3 \end{cases}$			
9(b)	Determine i) f(x) ii) k iii) Mean(X) If a random variable X has a poisson distribution such that P(1)=P(2), find i) Mean of the distribution ii) P(4) iii) P(X≥1) iv) P(1<X<4)	6	20BSX15.2	L3

- 10 A Population consists of five members 2,3,6,8 and 11. Consider all possible samples of size two each can be drawn with replacement from the population find
- (a) Population mean
 (b) Standard deviation of the population
 (c) The mean of the sampling distribution of means
 (d) The Standard deviation of the sampling distribution of means
- 12 20BSX15.3 L3

OR

- 11 (a) Define the following terms
 i) Population ii) Sample iii) Parameter iv) Statistic v) Standard Error of a Statistic
- 11(b) Measurements of the weights of a random sample of 200 ball bearings made by a certain machine during one week showed a mean of 0.824 and a standard deviation of 0.042. Find the maximum error at 95% confidence level. Also find the 95% confidence limits for the true mean.
- 5 20BSX15.3 L1
 7 20BSX15.3 L3

12 Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results.

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Test whether the two horses have same running capacity. (Table Value of $t = 2.2$)

12 20BSX15.4 L3

OR

- 13 (a) Define i) Critical region ii) Level of Significance in hypothesis testing.
- The following table shows the number of air accidents of each day of a week. Test whether these accidents are uniformly distributed over a week
- 4 20BSX15.4 L1

13(b)

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Accidents	147	125	160	118	149	128	150

8 20BSX15.4 L3

(Chi-Square at $6df = 12.59$)

14 Obtain the regression lines of Y on X and X on Y from the following table and estimate the blood pressure when the age is 45 years.

Age in years(X)	56	42	72	36	63	47	55	49	38	42	68	60
Blood pressure(Y)	147	125	160	118	149	128	150	145	115	140	152	155

12 20BSX15.5 L3

OR

- 15(a) Write the normal equations to fit a straight line using the principle of least squares.
- 3 20BSX15.5 L2

Fit a second degree parabola to the following data using the principle of least squares

15(b)

X	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Y	1.1	1.3	1.6	2.0	2.7	3.4	4.1

9 20BSX15.5 L3

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	ECE	Academic Year	2021 - 2022
Course Code	20EC403	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Pulse and Digital Circuits				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Under what Condition high pass RC Circuit act as Differentiator?	20EC403.1	L1
2	Define the following for a transistor switch i) Rise Time and ii) Fall Time.	20EC403.2	L1
3	What type of triggering is used in Monostable Multivibrator?	20EC403.3	L1
4	What are the Time Base Generators?	20EC403.4	L1
5	Distinguish between Sampling Gates and Logic Gates.	20EC403.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the response of High-Pass RC circuit for square wave input.	6M	20EC403.1	L2
6 (b)	A Step Generator of 50 Ω impedance applies a 10V step of 2.2ns rise time to a series combination of a capacitance C and Resistance 50 Ω . There appears across R a pulse of amplitude 1V Find The Capacitance C.	6M	20EC403.1	L2

OR

7 (a)	With the help of a neat circuit diagram, explain the working of a two level diode clipper.	8M	20EC403.1	L2
7 (b)	If A Square Wave of 5kHz is applied to an RC High Pass Circuits and the resultant waveform is tilted from 15V to 10V Find the Lower 3dB frequency of the High Pass Circuit.	4M	20EC403.1	L3
8 (a)	Explain the design of the transistor switch.	8M	20EC403.2	L2
8 (b)	For a common emitter circuit, V_{cc} is 15V, R_c is 1.5k Ω and I_b is 0.3mA. Determine the value of h_{fe} for saturation to occur and If R_c is changed to 500 Ω will the transistor be saturated?	4M	20EC403.2	L4

OR

9 (a)	Explain the working of Collector Coupled Bistable Multivibrator with the help of neat diagram.	6M	20EC403.2	L2
9 (b)	A Silicon Transistors with h_{fe} equal to 20 are available. If $V_{cc}=V_{bb}=10V$ Design the Bistable Multivibrator.	6M	20EC405.2	L4
10 (a)	Derive an expression for the frequency of oscillation of an astable multivibrator.	12M	20EC403.3	L3

OR

11 (a)	Derive the expression for gate width of a monostable multivibrator.	6M	20EC403.3	L3
11 (b)	Design a collector coupled one shot with a gate width of 3ms, using npn transistors.	6M	20EC403.3	L2

12 (a)	Draw the Circuit of miller integrator and explain how it improves the linearity of the sweep waveform.	6M	20EC403.4	L2
12 (b)	Explain the basic principles behind Bootstrap time base generator.	6M	20EC403.4	L2

OR

13 (a)	Derive the relation between slope, transmission and displacement errors.	6M	20EC403.4	L4
13 (b)	Design a relaxation oscillator to have 2kHz output frequency, using specifications $I_p=2\mu A$, $I_v=1mA$, $V_{eb}(sat)=3V$ and intrinsic stand off ratio is 0.68 to 0.82	6M	20EC403.4	L4

14 (a)	Compare DTL, TTL, ECL, and RTL Logic families.	6M	20EC403.5	L4
14 (b)	Define Propagation Delay, Fan-in, Fan-out, Noise Margin, Speed Power Product and Power Dissipation.	6M	20EC403.5	L1
OR				
15 (a)	Write advantages and disadvantages of unidirectional diode sampling gates and application of sampling gates.	6M	20EC403.5	L2
15 (b)	Explain the operation of Four Diode sampling gate.	6M	20EC403.5	L2

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	CE	Academic Year	2021 - 2022
Course Code	20CE403	Test Duration	3 Hrs.	Max. Marks	70
Course	CONCRETE TECHNOLOGY			Semester	IV

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	List any four properties of cement in field.	20CE403.1	L1
2	Define Segregation and Bleeding.	20CE403.2	L1
3	State the principle of Ultrasonic Pulse Velocity Test.	20CE403.3	L1
4	What are light weight aggregates?	20CE403.4	L1
5	List any four factors affecting the choice of mix proportions.	20CE403.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Write short notes on various types of cement.	12 M	20CE403.1	L2
OR				
7 (a)	Explain any two tests carried on aggregate.	6M	20CE403.1	L2
7 (b)	Illustrate the briefly note on importance of the quality of water used for concreting.	6M	20CE403.1	L2
8	Briefly discuss the concrete manufacturing process.	12M	20CE403.2	L2
OR				
9 (a)	Illustrate various factors influencing the Workability of Concrete?	6M	20CE403.2	L2
9 (b)	What are the properties of fresh concrete?	6M	20CE403.2	L2
10 (a)	Discuss the importance of Non-Destructive tests	6M	20CE403.3	L2
10 (b)	List out the factors influencing the strength results in case of hardened concrete.	6M	20CE403.3	L2
OR				
11	Explain in detail about the determination of Compressive and Flexural strength of concrete.	12M	20CE403.3	L2
12	Give a brief note on polymer concrete.	12M	20CE403.4	L2
OR				
13 (a)	Write a short note on (a) High performance concrete (b) Fiber reinforced concrete (c) SIFCON	6M	20CE403.4	L2
13 (b)	Describe in detail about Shotcrete and its advantages.	6M	20CE403.4	L2
14	Design a concrete mix for construction of an elevated water tank. The specified design strength of concrete (characteristic strength) is 30 MPa at 28 days measured on standard cylinders. Standard deviation can be taken as 4 MPa. The specific gravity of FA and C.A. are 2.65 and 2.7 respectively. The dry rodded bulk density of C.A. is 1600 kg/m ³ , and fineness modulus of FA is 2.80. Ordinary Portland cement (Type I) will be used. A slump of 50 mm is necessary. C.A. is found to be absorptive to the extent of 1% and free surface moisture in sand is found to be 2 per	12M	20CE403.5	L3

cent. Assume any other essential data.

OR

- 15 Explain the concept of mix design and mention the method of proportioning. 12M 20CE403.5 L3

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Degree	B. Tech. (U. G.)	Program	Mechanical Engg.	Academic Year	2021 - 2022
Course Code	20ME403	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	KINEMATICS OF MACHINERY				
Part A (Short Answer Questions 5 x 2 = 10 Marks)					
No.	Questions (1 through 5)			Learning Outcome (s)	DoK
1	What is meant by degrees of freedom of a mechanism?			20ME403.1	L1
2	State an application of Peaucellier mechanism.			20ME403.2	L1
3	What are the different types of instantaneous centres?			20ME403.3	L1
4	Why a Roller follower is preferred over Knife Edge follower?			20ME403.4	L1
5	What is the Interference in Involute Gears? How to avoid it?			20ME403.5	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)					
No.	Questions (6 through 15)	Marks		Learning Outcome (s)	DoK
6 (a)	Discuss various types of constrained motion.	6M		20ME403.1	L2
6 (b)	How is the Whitworth quick-return mechanism and crank slotted-lever mechanism different from each other? Explain.	6M		20ME403.1	L2
OR					
7 (a)	Explain with neat figures the inversions of Double Slider Crank Chain.	6M		20ME403.1	L2
7 (b)	Describe different inversions of quadric cycle chain.	6M		20ME403.1	L2
8 (a)	Explain with a neat sketch, Pantograph mechanism. State its applications.	6M		20ME403.2	L2
8 (b)	What is an automobile steering gear? What are its types? Which steering gear is preferred and why?	6M		20ME403.2	L2
OR					
9 (a)	What is an automobile steering gear? Derive the condition for correct steering of an automobile?	6M		20ME403.2	L3
9 (b)	Draw a neat sketch of the Scott Russell's mechanism, and explain its working. How this mechanism can be modified to produce Grasshopper mechanism.	6M		20ME403.2	L2
10 (a)	Explain how by means of Klein's construction the acceleration of a reciprocating engine is determined.	6M		20ME403.3	L2
10 (b)	What is instantaneous centre of rotation? State Kennedy's theorem.	6M		20ME403.3	L2
OR					
11 (a)	PQRS is a four bar chain with link PS fixed. The lengths of the links are PQ = 62.5 mm; QR = 175 mm; RS = 112.5 mm; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR and RS?	6M		20ME403.3	L3
11 (b)	What is the Coriolis acceleration component?	6M		20ME403.3	L2
12 (a)	Explain with sketches the different types of cams and followers.	6M		20ME403.4	L2
12 (b)	Discuss briefly the various types of belts used for the transmission of power.	6M		20ME403.4	L2
OR					
13	A Cam with 30mm as minimum dia is rotating clockwise at uniform speed of 1300rpm and has to give the following motion	12M		20ME403.4	L3

to the roller follower 12mm in Dia

(a) follower to complete the outstroke of 25mm during 120° of cam rotation with uniform Acceleration and Retardation

(b) follower to dwell for 60° of cam rotation

(c) follower to return to its initial position during 90° of cam rotation with uniform Acceleration and Retardation (d) follower to dwell for the remaining 90° of cam rotation. Draw the Cam profile if the axis of the roller follower passes through the axis of the cam, also determine Max. Velocity and Acceleration of the follower during the outstroke and return stroke.

- | | | | | |
|----|--|-----|-----------|----|
| 14 | Derive an expression for length of path of contact, length of arc contact and contact ratio for a pair of involute gears in contact. | 12M | 20ME403.5 | L2 |
| | OR | | | |
| 15 | Two 20° Involute Spur gears have a Velocity Ratio of 2.5 and mesh externally. The module is 4mm and addendum is equal to 1.23 module. The pinion rotates at 150rpm. Find
(1) Minimum No. of teeth on each wheel to avoid interference.
(2) No. of pairs of teeth in contact.
(3) Max. Sliding Velocity | 12M | 20ME403.5 | L3 |

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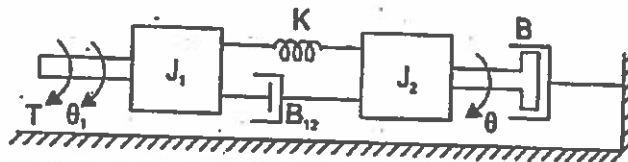
Degree	B. Tech. (U. G.)	Program	EEE & ECE	Academic Year	2021 - 2022
Course Code	20EE403	Test Duration	3Hrs	Max. Marks	70
Course	Control Systems			Semester	IV

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	What are the properties of signal flow graph?	20EE403.1	L1
2	What is steady-state error?	20EE403.2	L1
3	What are the necessary conditions for stability of root locus?	20EE403.3	L1
4	Define corner frequency in bode diagram.	20EE403.4	L1
5	List any three properties of state transition matrix.	20EE403.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

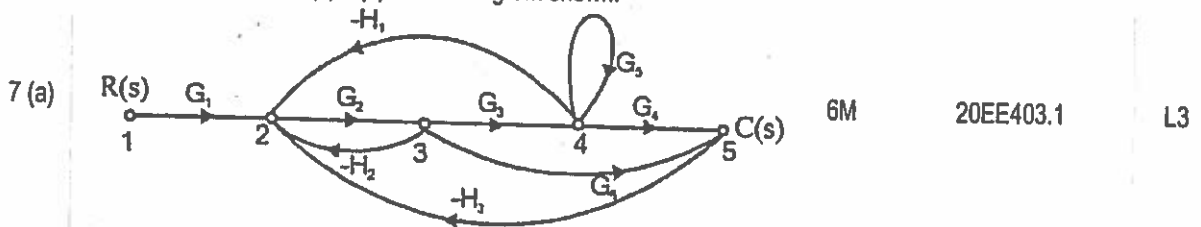
No.	Questions (6 through 11)	Marks	Learning Outcome (s)	DoK
6 (a)	For the mechanical rotational system derive the transfer function $\Theta(s)/T(s)$.	6M	20EE403.1	L3
6 (b)	Explain about closed loop control system with an example.	6M	20EE403.1	L2



6 (b)	Explain about closed loop control system with an example.	6M	20EE403.1	L2
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OR

Find the overall gain $C(s)/R(s)$ for the diagram shown.



7 (a)	Find the overall gain $C(s)/R(s)$ for the diagram shown.	6M	20EE403.1	L3
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7 (b)	Explain the operation of synchro transmitter and receiver.	6M	20EE403.1	L2
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8 (a)	A unity feedback control system is characterized by the following open loop transfer function $G(s) = (s + 10)/(s + 2)(s + 6)$. Determine its transient response for unit step input.	6M	20EE403.2	L3
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8 (b)	What are the generalized error coefficients?	6M	20EE403.2	L2
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OR

9 (a)	A unity feedback system has the forward transfer function $G(s) = \frac{K(2s+1)}{s(5s+1)(s+1)^2}$. When the input $r(t) = 1 + 6t$, determine the minimum value of K so that steady state error is less than 0.	10M	20EE403.2	L3
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9 (b)	What are the effects of PI controller on system performance?	2M	20EE403.2	L2
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10	Construct the Routh array and determine the stability of the system represented by the characteristic equation, $s^7 + 9s^6 + 24s^5 + 24s^4 + 24s^3 + 24s^2 + 23s + 15 = 0$. Comment of the location of roots of the characteristic equation and stability.	12M	20EE403.3	L3
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OR

11	Sketch the root locus of the system whose open loop transfer function is $G(s) = \frac{K}{s(s^2+4s+13)}$. Comment on stability.	12M	20EE403.3	L3
12	For the following transfer function, plot the bode plot and comment on stability. $G(s) = \frac{5(1+2s)}{(4s+1)(0.25s+1)}$	12M	20EE403.4	L3
13	Consider unity feedback system whose open loop transfer function is, $G(s) = \frac{K}{s(0.2s+1)(0.05s+1)}$	12M	20EE403.4	L3
14	Obtain the state transition matrix for the state equation of the continuous control system. $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 1 & 2 & 3 \\ 6 & 2 & 4 \\ 7 & 8 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$	12M	20EE403.5	L3
15	Check the given system is completely controllable and completely observable. Comment on it. $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 2 & 4 \\ 1 & 5 & 2 \\ 1 & -2 & 5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 1 \\ 2 \\ 0 \end{bmatrix} u$ $y = [1 \quad 1 \quad 0] \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$	12M	20EE403.5	L3

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	CSE	Academic Year	2021 - 2022
Course Code	20CS402	Test Duration	3 Hrs.	Max. Marks	70
Course	Data Warehousing and Data Mining		Semester	IV	
Part A (Short Answer Questions 5 x 2 = 10 Marks)					
No.	Questions (1 through 5)			Learning Outcome (s)	DoK
1	List any four OLAP operations.			20CS402.1	L1
2	List any four data mining tools.			20CS402.2	L1
3	What is a decision tree?			20CS402.3	L1
4	What is meant by association rule?			20CS402.4	L1
5	Define Agglomerative Clustering.			20CS402.5	L1
Part B (Long Answer Questions 5 x 12 = 60 Marks)					
No.	Questions (6 through 15)		Marks	Learning Outcome (s)	DoK
6	Illustrate the schemas of the data warehouse.		12M	20CS405.1	L2
OR					
7 (a)	Explain in detail about the multidimensional data model.		6M	20CS405.1	L2
7 (b)	Differentiate OLTP and OLAP with features.		6M	20CS405.1	L2
8 (a)	Show with diagrammatic illustration of the steps involved in the process of the Knowledge Discovery from Data.		6M	20CS405.2	L2
8 (b)	Discuss the major issues of Data Mining.		6M	20CS405.2	L2
OR					
9 (a)	Explain in detail about the Data Transformation method with suitable example		6M	20CS405.2	L2
9 (b)	Elaborate the different Data Reduction techniques.		6M	20CS405.2	L2
10	Discuss in detail about Decision tree induction algorithm with an example.		12M	20CS405.3	L2
OR					
11	Explain the Naive Bayesian Classification algorithm.		12M	20CS405.3	L2
12	Analyze the steps involved in Apriori Algorithm.		12M	20CS405.4	L2
OR					
13 (a)	Discuss about FP-growth algorithm for the following given example {M,O,N,K,E,Y} {D,O,N,K,E,Y} {M,A,K,E} {M,U,C,K,Y} {C,O,O,K,I,E}, Support= 60 %, Confidence = 80 %.		6M	20CS405.4	L2
13 (b)	Discuss about Quantitative association mining.		6M	20CS405.4	L2
14	Elaborate the various Clustering methods with an example.		12M	20CS405.5	L2
OR					
15	Discuss in detail about K – MEANS algorithm with an example.		12M	20CS405.5	L2

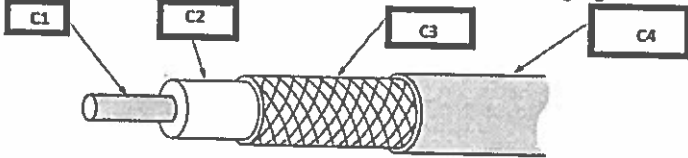
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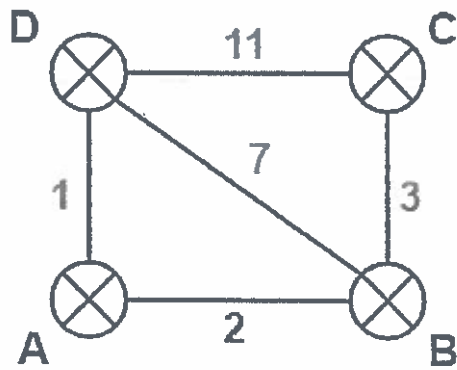
Degree	B. Tech. (U. G.)	Program	CSM/CSD	Academic Year	2021 - 2022
Course Code	20CS502	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	COMPUTER NETWORKS				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	<p>Mark the components of a coaxial cable in the following figure.</p> 	20CS502.1	L1
2	Identify any two error correcting code mechanism in data link layer.	20CS502.2	L1
3	How IPv6 differs from IPv4?	20CS502.3	L4
4	What is multiplexing?	20CS502.4	L2
5	List the typical element of email user agents.	20CS502.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

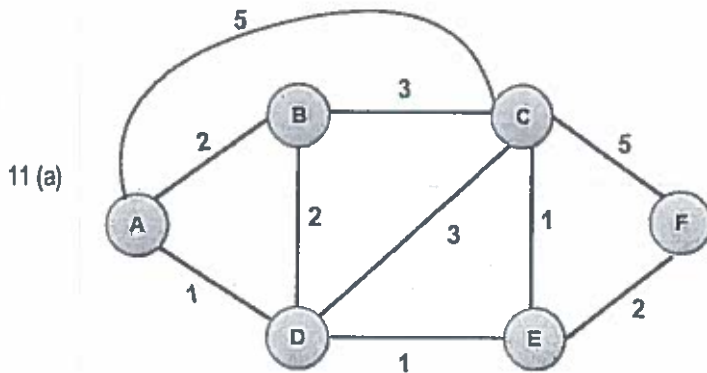
No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw the ISO-OSI Architecture and outline the functions performed by each layer.	8M	20CS502.1	L2
6 (b)	Discuss some of the design issues of the computer network layers in general.	4M	20CS502.1	L1
OR				
7 (a)	Explain any four network topologies with a neat sketch	8M	20CS502.1	L2
7 (b)	Interpret the terms in brief about unicasting, broadcasting and multicasting with respect to network hardware.	6M	20CS502.1	L1
8 (a)	Explain with a neat sketch about the sliding window protocol.	8M	20CS502.2	L2
8 (b)	For CRC polynomial, each of the following, explain whether the errors during message transmission will be detected by the receiver: (a) There was a single-bit error. (b) There were two isolated bit errors.	4M	20CS502.2	L3
OR				
9 (a)	Explain about any one of the Multiple access protocols. Sixteen-bit messages are transmitted using a Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single-bit errors? Show the bit pattern transmitted for the message 1101001100110101. Assume that even parity is used in the Hamming code.	8M	20CS502.2	L2
9 (b)		4M	20CS502.2	L3
10 (a)	Tabulate the shortest path for all nodes for the following network using distance vector routing.	7M	20CS502.3	L3



10 (b) Discuss the Four issues must be addressed to ensure quality of service in network layer 5M 20CS502.3 L2

OR

Tabulate the shortest path for all nodes for the following network using Links state routing.



11 (a) 7M 20CS502.3 L3

11 (b) Briefly discuss about the approaches to Congestion Control with its timeline. 5M 20CS502.3 L2

12 (a) Explain about TCP Addressing with respect to transport layer 6M 20CS502.4 L2

12 (b) Explain about TCP Congestion control with respect to transport layer. 6M 20CS502.4 L2

OR

13 (a) Explain the UDP header and its components with a neat sketch 6M 20CS502.4 L2

13 (b) Explain the TCP Segment header and its components with a neat sketch. 6M 20CS502.4 L2

14 (a) Write a short note on DNS Namespace. 6M 20CS502.5 L1

14 (b) Explain about Domain Resource Record with its format 6M 20CS502.5 L2

OR

15 (a) Explain about the architecture of email with a neat sketch. 6M 20CS502.5 L1

15 (b) Explain about any one of mail transport protocols with its purpose. 6M 20CS502.5 L2

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Degree	B. Tech. (U. G.)	Program	CE	Academic Year	2021 - 2022
Course Code	20CE404	Test Duration	3 Hrs.	Max. Marks	70
Course	SOIL MECHANICS			Semester	IV

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Relate between void ratio, degree of saturation, specific gravity and water content from fundamental.	20CE404.1	L2
2	List any four factors affecting permeability of soil.	20CE404.2	L1
3	List any four assumptions made in Boussinesq's theory for point load.	20CE404.3	L1
4	Categorize any two merits and demerits of direct shear test.	20CE404.4	L1
5	State the significance of stability number	20CE404.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the salient features of Indian standard soil classification system.	6M	20CE404.1	L2
6 (b)	A natural soil deposit has a bulk unit weight of 18 kN/m ³ and a water content of 5%. Calculate the amount of water in liters required to be added to 1 Cu.m of soil to raise the water content to 15%. Assume the void ratio to remain constant. Take G _s = 2.60	6M	20CE404.1	L3

OR

7 (a)	Explain the Effect of compaction on soil properties. The mass of wet soil when compacted in a mould was 19.55 kN. The water content of the soil was 16%. If the volume of the mould is 0.95 m ³ , If G = 2.68 then determine:	6M	20CE404.1	L2
7 (b)	(i) dry unit weight (ii) void ratio (iii) degree of saturation (iv) percent air voids	6M	20CE404.1	L3
8 (a)	What is flow net? State its properties and application. What is the quantity of seepage between two successive flow line and equipotential line? Explain with neat sketch.	6M	20CE404.2	L2
8 (b)	In a falling head permeability test, head causing flow was initially 500 mm and it drops to 20 mm in 5 minutes. Calculate the time required for the head to fall 250 mm.	6M	20CE404.2	L3

OR

9 (a)	Derive an expression for coefficient of permeability using variable head permeameter test with a neat sketch.	6M	20CE404.2	L2
9 (b)	In order to compute the seepage loss through the foundation of a cofferdam, flownets were constructed. The result of the flownet study gave N _f = 6, N _d = 16. The head of water lost during seepage was 19.68 m. If the hydraulic conductivity of the soil is k = 13.12x10 ⁻⁵ m/s, compute the seepage loss per metre length of dam per day	6M	20CE404.2	L3
10 (a)	Write the assumptions of Terzaghi's one - dimensional consolidation theory.	5M	20CE404.3	L2
10 (b)	Find the intensity of vertical pressure at a point 3 m directly below 25 kN point load acting on a horizontal ground surface. What will be the vertical pressure at a distance 2 m horizontally away from the axis of loading and at a same depth of 3 m? Use Boussinesq's equation.	7M	20CE404.3	L3
OR				
11 (a)	Explain any one method of Computation of Rate of Settlement.	5M	20CE404.3	L2
11 (b)	A Subsurface exploration at the site of a proposed building reveals the existence of 2.4 m thick layer of soft clay below a stratum of coarse	7M	20CE404.3	L3

sand which is 4 m thick and extends from the ground surface up to the top of the clay layer. The ground water table is at 2.5 m below the ground surface. The laboratory tests indicate the natural water content of the clay 40%, average liquid limit as 45% and specific gravity of solids as 2.75. The unit weight of the sand above and below water table is 17.8 kN/m^3 and 21 kN/m^3 respectively. Estimate the probable settlement of the building, if its construction will increase average vertical pressure on the clay layer by 71 KPa.

12 (a) What are the various types of shear tests based on drainage conditions? Explain them. 6M 20CE404.4 L2

12 (b) A sample of dry sand was subjected to triaxial test, with a confining pressure of 150 kN/m^2 . The angle of shearing resistance was found to be 33° . At what value of major principal stress, the sample is likely to fail. 6M 20CE404.4 L3

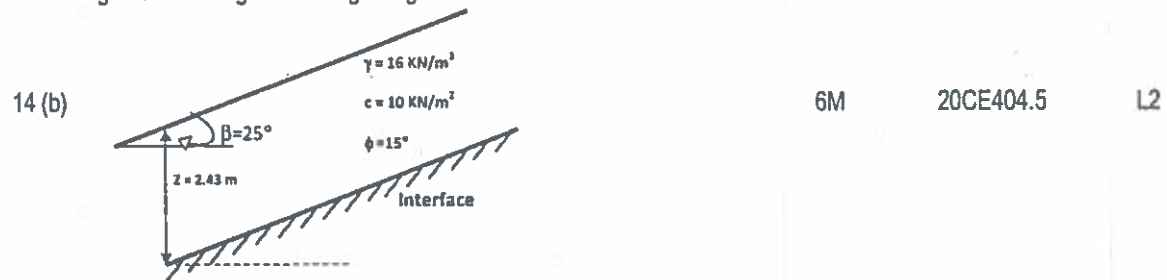
OR

13 (a) A sample of dry cohesion less soil was tested in a triaxial machine. If the angle of shearing resistance is 36° and the confining pressure 100 kN/m^2 , determine the deviator stress at which the sample failed. 6M 20CE404.4 L3

13 (b) Explain with neat sketches the procedure of conducting Direct Shear test. 6M 20CE404.4 L2

14 (a) What are the various methods of analysis of infinite slopes? Explain briefly any one of method. 6M 20CE404.5 L1

Find the Factor of safety against sliding along the interface for the infinite slope shown in Figure below. Also find the height Z that will give F.S of 2 against sliding along the interface.



OR

15 Explain the friction Circle method of analysis of stability of slopes. 12M 20CE404.5 L1

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Degree	B.Tech.(U.G.)	Program	Mechanical Engineering	Academic Year	2021-2022
Course Code	20ME404	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Fluid Mechanics and Hydraulic Machines				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define viscosity	20ME404.1	L1
2	Compare between Stream line and Streak line.	20ME404.2	L2
3	List the three types of Similarities.	20ME404.3	L1
4	Derive an expression for the force exerted by the jet on a stationary vertical plate.	20ME404.4	L3
5	Write the difference between impulse turbines and reaction turbines	20ME404.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Derive the expression for the hydrostatic force exerted on the vertically submerged plane and obtain the total pressure and position of center of pressure.	12M	20ME404.1	L3
OR				
7 (a)	Enumerate list of manometers and explain any one with neat sketch	6M	20ME404.1	L2
7 (b)	Briefly explain the conditions for stability of a floating body and submerged body.	6M	20ME404.1	L2
8(a)	Explain the Reynold's experiment with the help of a neat sketch.	6M	20ME404.2	L2
8 (b)	Derive Bernoulli's equation with assumptions.	6M	20ME404.2	L3
OR				
9 (a)	Define and explain the terms Hydraulic gradient line and Total energy line.	6M	20ME404.2	L2
9 (b)	Explain the characteristics of Laminar and Turbulent boundary layer over a thin flat plate with a neat figure.	6M	20ME404.2	L2
10 (a)	What are the different laws on which models are designed for dynamic similarity? Where are they used?	6M	20ME404.3	L2
10 (b)	State and Explain Buckingham's π - theorem	6M	20ME404.3	L2
OR				
11 (a)	Define Buckingham's π -theorem. What are the advantages of Pi theorem over the Rayleigh's method for dimension analysis?	6M	20ME404.3	L2
11 (b)	What do you mean by dimensionless numbers? Explain various types of dimensionless numbers	6M	20ME404.3	L2
12 (a)	A jet of water of diameter 75 mm moving with a velocity of 25 m/s strikes a fixed plate in such a way that the angle between the jet and plate is 60° . Find the force exerted by the jet on the plate (i) in the direction normal to the plate (ii) in the direction of the jet.	6M	20ME404.4	L3
12 (b)	The internal and external diameters of the impeller of a centrifugal pump are 200mm and 400mm respectively. The pump is running at 1200 rpm. The vane angles of the impeller at inlet and outlet are 20° and 30° respectively. The water enters the impeller radially and velocity of flow is constant. Determine the work done by the impeller per unit weight of water. .	6M	20ME404.4	L3

		OR			
13 (a)	Explain the working of Centrifugal pump with a neat sketch.		6M	20ME404.4	L2
13 (b)	A centrifugal pump with impeller of outer dia. 45 cm and inner dia. of 25 cm, is required to develop a net head of 20 m. Find the lowest speed to start the pumping.		6M	20ME404.4	L3
14 (a)	Explain in detail about performance curves of turbines		6M	20ME404.5	L2
14 (b)	A Pelton wheel has a mean bucket speed of 35 m/s with a jet of water flowing at the rate of 1 m ³ /s under a head of 270 m. The buckets deflect the jet through an angle of 170°. Calculate the power delivered to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.98.		6M	20ME404.5	L3
		OR			
15 (a)	A single jet Pelton wheel develops 2 MW power under a gross head of 360m, while running at 560 rpm. The water is supplied through a penstock which is 1200 m long. Take Cv = 0.98 and friction factor f= 0.03, hydraulic efficiency as 85% . The head lost in the penstock is 12 m of water. Find out the quantity of water supplied to the turbine, diameter of the nozzle and the diameter of the penstock .		6M	20ME404.5	L3
15 (b)	Explain in detail the working principle of Kaplan Turbine with neat sketch.		6M	20ME404.5	L2

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Degree	B. Tech. (U. G.)	Program	EEE	Academic Year	2021 - 2022
Course Code	20EE404	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	INDUCTIONS MOTORS AND SYNCHRONOUS MACHINES				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Why induction motor called as asynchronous motor?	20EE404.1	L1
2	Identify the need of starter for induction motor	20EE404.2	L1
3	Identify the role of centrifugal switches provided in many single-phase induction motors	20EE404.3	L1
4	Define the term voltage regulation in alternator	20EE404.4	L1
5	Enlist the applications of synchronous condenser	20EE404.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Explain the construction and working principle of 3 phase induction motor	6M	20EE404.1	L2
6 (b)	Explain in detail the equivalent circuit of 3 phase induction motor.	6M	20EE404.1	L2
OR				
7	Derive an expression for the torque of an induction motor and torque-slip characteristics and obtain the condition for maximum torque.	12M	20EE404.1	L2
OR				
8	Describe the following: (i) Rotor resistance starter for starting slip ring induction motor. (ii) Speed control of an induction motor by changing the frequency and poles	12M	20EE404.2	L2
OR				
9 (a)	With a neat diagram, Discuss about the slip power recovery scheme of induction motor	6M	20EE404.2	L3
9 (b)	Compare the relative merits and demerits of stator resistance starter	6M	20EE404.2	L2
10 (a)	Explain the principle of operation of single-phase induction motor based on "double revolving field theory".	6M	20EE404.3	L2
10 (b)	Explain in detail the operation of capacitor start and run induction motor	6M	20EE404.3	L3
OR				
11 (a)	The equivalent impedance of the main and auxiliary winding in a capacitor motor are $(15 + j 25)\Omega$ and $(50 + j120)\Omega$ respectively, while the capacitance of the capacitor is $12 \mu F$. Estimate the line current at starting a 230 V, 50Hz supply.	8M	20EE404.3	L2
11 (b)	Identify the features of no load and blocked rotor test	4M	20EE404.3	L2
12 (a)	Demonstrate the POTIER method of determining the regulation of an alternator.	8M	20EE404.4	L1
12 (b)	Compare the Constructional details of rotor of both non-salient and salient pole synchronous machine.	4M	20EE404.4	L2
OR				
13 (a)	Describe the role of voltage regulation in alternator. Also explain synchronous impedance method for determining regulation of an alternator.	8M	20EE404.4	L2
13 (b)	Identify the features of synchronizing of alternator. Describe any one method of synchronizing	4M	20EE404.4	L1

14 (a)	Explain the principle of operation of a 3-phase synchronous motor with neat sketch	6M	20EE404.5	L2
14 (b)	Derive an expression for the power developed in an synchronous motor.	6M	20EE404.5	L3
OR				
15 (a)	Explain any two starting methods of synchronous motor in detail.	8M	20EE404.5	L2
15 (b)	Illustrate the performance of a synchronous motor using V and inverted V curves.	4M	20EE404.5	L2

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Degree	B. Tech. (U. G.)	Program	ECE	Academic Year	2021 - 2022
Course Code	20EC404	Test Duration	3 Hrs.	Max. Marks	70
Course	Electromagnetic Waves & Transmission Lines		Semester	IV	

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define the terms Phase velocity and group velocity.	20EC404.1	L1
2	List any four applications of Smith Chart.	20EC404.2	L1
3	State Gauss's law and write its expression.	20EC404.3	L1
4	What is the significance of boundary conditions?	20EC404.4	L1
5	Define Skin effect and give its expression in medium parameter.	20EC404.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Derive the expression for characteristic impedance in terms of primary constants and angular frequency.	6M	20EC404.1	L3
6 (b)	For a transmission line $G = 0.02$, $C = 10\text{pF}$, $L = 0.2\mu\text{H}$, $R = 0.1\Omega$. Find the propagation constant and characteristic impedance at 1MHz.	6M	20EC404.1	L3
OR				
7 (a)	Derive the condition for distortion less transmission line and also plot the open circuit short circuit wave forms of voltage and current at the receiving end.	8M	20EC404.1	L2
7 (b)	A lossless line has $Z_0 = 50\Omega$ and $\beta = 0.2\pi \text{ m}^{-1}$ at $f = 60\text{MHz}$. Find the distributed parameters L and C of the line.	4M	20EC404.1	L2
8 (a)	What is Smith Chart? Explain its significance.	8M	20EC404.2	L2
8 (b)	An aerial of $(200 - j300)\Omega$ is to be matched with 500Ω lines. The matching is to be done by means of a low loss line 600Ω stub line. Find the position and length of the stub line used if the operating wavelength is 20 m.	4M	20EC404.2	L3
OR				
9 (a)	Characteristic impedance of a low loss transmission line is 90Ω and it is terminated by another impedance of $(130 - j980)\Omega$. The wavelength of the line is 2.6m. Determine: i) VSWR, ii) Maximum impedance and iii) Minimum impedance.	8M	20EC404.2	L3
9 (b)	Write a brief note on the various impedance matching techniques.	4M	20EC404.2	L2
10 (a)	Point charges Q1 and Q2 are respectively located at (4, 0, -3) and (2, 0, 1) if $Q2 = 4\text{nC}$. Find Q1 such that the 'E' at (5, 0, 6) has no z - component.	6M	20EC404.3	L3
10 (b)	Obtain the expression for the electric field due to finite length of the conductor along Z axis.	6M	20EC404.3	L3
OR				
11 (a)	In a certain conducting region, $H = yz(x^2 + y^2)ax - y^2xzay + 4x^2y^2az \text{ mA/m}$. Determine J at (5, 2, -3).	4M	20EC404.3	L2
11 (b)	Find an expression for the magnetic field produced by a straight current carrying conductor of finite length along Z axis.	8M	20EC404.3	L3
12 (a)	Discuss the boundary condition in static electric field at the interface between two perfect dielectric media.	6M	20EC404.4	L2
12 (b)	Given $E = 10 \sin(\omega t - \beta z)ay \text{ V/m}$ in free space, determine D B and H.	6M	20EC404.4	L3

OR				
13 (a)	Define polarization and explain each of its types.	4M	20EC404.4	L2
13 (b)	Derive Maxwell's equations in Integral and Differential forms for time varying fields.	8M	20EC404.4	L3
OR				
14 (a)	Define uniform plane wave. Prove that uniform plane wave does not have field component in the direction of propagation.	6M	20EC404.5	L3
14 (b)	Discuss wave propagation in lossless media and in free space.	6M	20EC404.5	L3
OR				
15 (a)	An EM wave travels in space with $E=100e^{j(0.866y+0.5z)}$ a _x V/m. Determine ω , λ , H.	6M	20EC404.5	L2
15 (b)	Obtain the expressions for Reflection and Transmission coefficients for Normal Incidence of Uniform Plane wave at Dielectric interface.	6M	20EC404.5	L3

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	CSE/CSE(AI&ML)/CS(DS)	Academic Year	2021 - 2022
Course Code	20CS302	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Operating Systems				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define operating system.	20CS404.1	L1
2	Define process.	20CS404.2	L1
3	What is safe state?	20CS404.3	L1
4	Define Thrashing.	20CS404.4	L1
5	List any two file attributes.	20CS404.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	What are the functionalities of Operating Systems? Explain in detail	6M	20CS404.1	L2
6 (b)	Explain the following Operating Systems concepts a. Multi - Programming b. Multi -Tasking	6M	20CS404.1	L2

OR

7	What is system call? Explain various system calls in detail	12M	20CS404.1	L2
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Consider the following four processes, with the length of the CPU burst time given in milliseconds, time slice = 3 ms

Process	Arrival Time(ms)	Burst Time (ms)	Marks	Learning Outcome (s)	DoK
P ₁	1	6	12M	20CS404.2	L3
P ₂	1	5			
P ₃	2	5			
P ₄	2	3			

Compute Average Waiting Time for a given process using FCFS, SJF and RR Algorithms.

OR

9 (a)	Explain about the different types of Schedulers in detail.	6M	20CS404.2	L2
9 (b)	Define Process, explain different Process states with a neat diagram.	6M	20CS404.2	L2

10 (a)	Explain how dining philosopher's problem is solved using Semaphores with an example.	6M	20CS404.3	L3
10 (b)	Explain the necessary condition for deadlock.	6M	20CS404.3	L2

OR

11	Consider the following page reference string : 7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2, 3, 0, 1 Assume demand paging with three frames, how many page faults would occur for the following page replacement Algorithms 1. LRU replacement 2. FIFO replacement	12M	20CS404.3	L3
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12 (a)	Write Short notes on Segmentation.	6M	20CS404.4	L1
12 (b)	Discuss about Demand paging.	6M	20CS404.4	L2

OR

13	Suppose that a disk drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 143. The queue of pending requests in FIFO order 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 starting from current head position. Determine the total distance that disk arm moves to satisfy all the pending request for FCFS, SSTF, SCAN, C-SCAN disk scheduling algorithm.	12M	20CS404.4	L2
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14(a)	Discuss about different file access methods.	6M	20CS404.5	L2
14(b)	Explain in detail about allocation methods.	6M	20CS404.5	L2
OR				
15	Explain in detail about file system structure and implementation.	12M	20CS404.5	L2

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	Civil Engineering	Academic Year	2021 - 2022
Course Code	20CE405	Test Duration	3 Hrs. Max. Marks	70	Semester
Course	CONSTRUCTION PROJECT MANAGEMENT				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define project planning process.	20CE405.1	L1
2	Differentiate between Activity on arrow network diagrams and activity on node network diagrams.	20CE405.2	L2
3	Define resource levelling and allocation.	20CE405.3	L1
4	What is Trenching?	20CE405.4	L1
5	Define safety management.	20CE405.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6	Explain the role of each constituent of the construction team? List the Project life Cycle Phases and stages in construction.	12M	20CE405.1	L2
OR				
7 (a)	Explain the planning and execution phrases in project management.	6M	20CE405.1	L2
7 (b)	Explain the initiation and implementation phrases in project management.	6M	20CE405.1	L1

8 (a)	Explain project planning process and also discuss the work breakdown structure.	4 M	20CE405.2	L2
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8 (b)	The Following table lists the activities, durations, and their sequence of operation for a construction project. Prepare the network and compute in a table their Early Start time (EST), Early Finish time (EFT), Late start time (LST), Late finish times (LFT). Determine the critical path and find the total float for all the activities?	8 M	20CE405.2	L2																										
<table border="1"> <thead> <tr> <th>Activity</th> <th>Duration(days)</th> </tr> </thead> <tbody> <tr><td>1-2</td><td>8</td></tr> <tr><td>1-3</td><td>10</td></tr> <tr><td>1-4</td><td>5</td></tr> <tr><td>2-7</td><td>6</td></tr> <tr><td>3-4</td><td>3</td></tr> <tr><td>4-5</td><td>7</td></tr> <tr><td>4-7</td><td>0</td></tr> <tr><td>5-6</td><td>4</td></tr> <tr><td>5-7</td><td>3</td></tr> <tr><td>5-8</td><td>6</td></tr> <tr><td>6-8</td><td>5</td></tr> <tr><td>7-8</td><td>5</td></tr> </tbody> </table>					Activity	Duration(days)	1-2	8	1-3	10	1-4	5	2-7	6	3-4	3	4-5	7	4-7	0	5-6	4	5-7	3	5-8	6	6-8	5	7-8	5
Activity	Duration(days)																													
1-2	8																													
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7-8	5																													

9 (a)	Differentiate between CPM and PERT Models for project scheduling.	4M	20CE405.2	L2
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9 (b)	A Construction company engaged in undertaking small projects has recently been awarded a construction project. The project activities and estimated time for their completion are listed in the table below along with the information on immediate predecessors. i. Construct a network for the project. ii. Determine the critical path and the project completion time. iii. What is the probability of completing the project in the completion time you have arrived at? iv. Determine the time interval within which the probability of completion of the project will be 90%	8M	20CE405.2	L3
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Activity	Duration in Days			Immediate predecessor
	t _o	t _n	t _p	
A	8	10	12	-
B	6	7	9	-
C	3	3	4	-
D	10	20	30	A
E	6	7	8	C
F	9	10	11	B,D,E
G	6	7	10	B,D,E
H	14	15	16	F
I	10	11	13	F
J	6	7	8	G,H
K	4	7	8	I,H
L	1	2	4	G,H

10 (a) Define direct and indirect cost? Discuss about time-cost trade-off? 4M 20CE405.3 L2

A Construction company has been awarded a contract to construct a flyover in a city with a completion time period of 18 months. The major activities in the project and the relationships among them, the normal and crash durations, and the corresponding normal and crash costs are given in the table below.

Activity	Immediate predecessors	Duration (Months)		Cost (in Rs.)	
		Normal	Crash	Normal	Crash
A	---	6	4	24,000	34,000
B	---	4	3	12,000	22,000
C	A	5	3	20,000	28,000
D	A	7	4	29,000	47,000
E	B	6	5	26,000	34,000
F	B	8	5	34,000	52,000
G	C, E	10	6	27,000	47,000
H	D, F	9	7	34,000	48,000

10 (b) 8M 20CE405.3 L2

OR

11 (a) What are the objectives of resource allocation? Explain the steps involved for doing resource smoothing? 4M 20CE405.3 L2

In a small construction project, there are nine activities. The duration of each activity and the labour required to them are given in the table. The project must be completed in 27 days. Nevertheless, the contractor wishes to carry out some resource levelling/smoothing in order that there are no excessive peaks or troughs in his labour schedule. Prepare labour schedule based on early start and late start of activities, and by visual inspection indicate the adjustment you would make in activities in order to perform resource scheduling.

Activities	Duration (days)	Resource required (Labour)
1-2	4	2
2-3	6	3
2-5	9	4
2-4	2	4
3-4	3	3
3-7	8	3
5-6	10	2
6-7	4	2
4-7	2	1

11 (b) 8M 20CE405.3 L2

12 (a) Explain in detail various methods of excavation-based on material used and the purpose. 6M 20CE405.4 L1

12 (b) Explain in detail about Hoisting equipment and Aggregate and concrete 6M 20CE405.4 L2

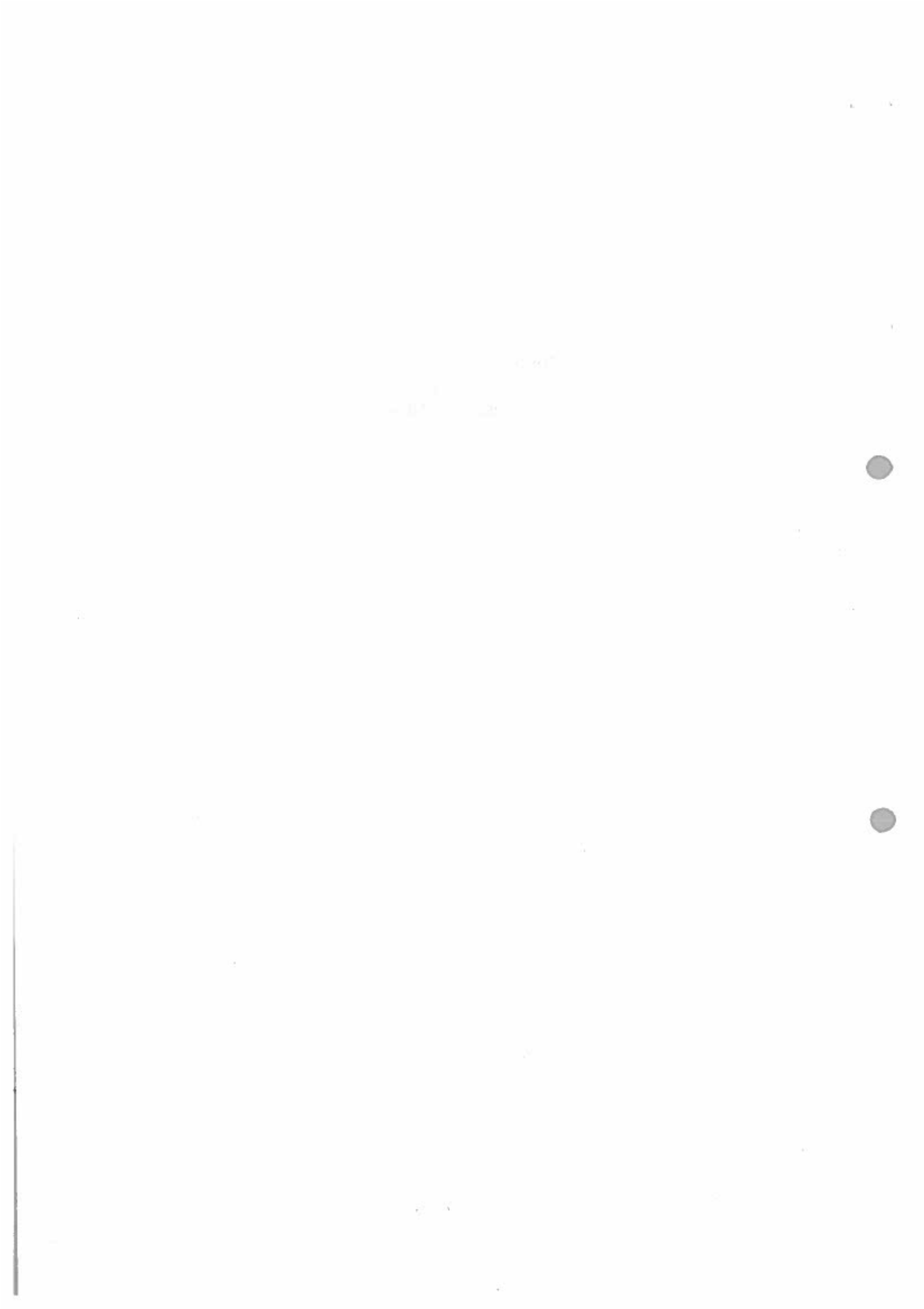
production equipment.

OR

13 (a)	What are the equipments used for earth work excavation? Compare and contrast among various Excavating and Earth Moving Equipments.	6M	20CE405.4	L2
13 (b)	Define compaction and explain in detail the different types of equipments used in Earthwork compaction.	6M	20CE405.4	L2
14 (a)	What is risk management and explain the steps in risk management.	6M	20CE405.5	L1
14 (b)	Discuss the causes of accidents on various sites.	6M	20CE405.5	L2
OR				
15 (a)	What is safety management and what are the measures and safety policies to be adopted?	6M	20CE405.5	L1
15 (b)	Determine the safety parameters for safety management.	6M	20CE405.5	L2

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	Mechanical Engineering	Academic Year	2021 - 2022
Course Code	20ME405	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	IC Engines and Gas Turbines				

Part A (Short Answer Questions 5x 2= 10 Marks)

No.	Questions (1 through 2)	Learning Outcome (s)	DoK
1	Define Mean Effective Pressure and Compression Ratio	20ME405.1	L1
2	Draw Actual port Timing Diagram for two Stroke Engine.	20ME405.2	L1
3	What are Different Ignition systems being used for SI Engine?	20ME405.3	L1
4	What is the Chemical Composition of Liquefied Petroleum Gas?	20ME405.4	L1
5	List any three applications of pulse jet engines?	20ME405.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 10)	Marks	Learning Outcome (s)	DoK
6 (a)	Draw the Dual Cycle P-V and T-S Diagram; Find the Efficiency in terms of Compression Ratio.	6M	20ME405.1	L2
6 (b)	In an Air Standard Diesel Cycle, the Compression ratio is 16, at the beginning isentropic compression, the temperature is 15 °C and the pressure is 0.1 MPa. Heat is added until the Temperature at the end of constant pressure process is 1480 °C .Calculate the following. (i) The cut-off ratio (ii) The heat supplied for Kg of air	6M	20ME405.1	L3
OR				
7 (a)	Draw the Diesel Cycle P-V and T-S Diagram; Find the Efficiency in terms of Compression Ratio.	7M	20ME405.1	L2
7 (b)	Explain (i) Time loss Factor (ii) Heat Loss Factor (iii) Volumetric Efficiency.	5M	20ME405.1	L2
8 (a)	Describe the working principle of the Four stroke CI Engine. Mention the typical values of Valve timing diagram for four stroke CI Engine	6M	20ME405.2	L2
8 (b)	Draw a labeled sketch showing the circuit diagram of Battery Ignition system and discuss its working principles.	6M	20ME405.2	L2
OR				
9 (a)	Classify the IC engines.	5M	20ME405.2	L2
9 (b)	Draw a labeled sketch showing the circuit diagram of Magneto Ignition system and Discuss its working principles	7M	20ME405.2	L2

10 (a)	What is the significance of heat balance sheet? Discuss the procedure to draw heat balance sheet for CI engine?	6M	20ME405.3	L2
10 (b)	What is wilan's line? How do you measure frictional power using this?	6M	20ME405.3	L2
OR				
11 (a)	Explain the Combustion Stages of SI Engine	6M	20ME405.3	L2
11 (b)	Explain knocking, properties and its effects in CI engine.	6M	20ME405.3	L2
12 (a)	Explain Different Categories of CI Emissions. Also explain various factors effecting exhaust emission.	7M	20ME405.4	L2
12 (b)	What are the Different Gaseous fuels and their Limitations?	5M	20ME405.4	L2
OR				
13 (a)	What is the use of LPG, hydrogen and natural gas in SI Engine?	6M	20ME405.4	L2
13 (b)	What is Cetane number? What is the role of Cetane number in the performance of engine?	6M	20ME405.4	L2
14 (a)	What are the different rocket propulsion systems? Brief the working differences between the propeller-jet, turbojet and turbo-prop	6M	20ME405.5	L3
14 (b)	A turbo-jet engine flying at a speed of 960 km/h consumes air at the rate of 54.5 kg/s calculate i). Exit velocity of the jet when the enthalpy change for the nozzle is 200 KJ/kg and velocity coefficient is 0.97. ii).fuel flow rate in kg/s when air fuel ratio is 75:1 iii). Thrust specific fuel consumption iv). Propulsive power v). Propulsive Efficiency.	6M	20ME405.5	L2
OR				
15 (a)	With a neat diagram explain the working of rocket engine.	5M	20ME405.5	L2
15 (b)	Draw the Brayton Cycle P-V and T-S Diagram; find the Efficiency in terms of Compression Ratio.	7M	20ME405.5	L2

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	EEE	Academic Year	2021 - 2022
Course Code	20EE405	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Electro Magnetic Field Theory				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Define Divergence, Gradient and Curl.	20EE405.1	L1
2	Express the energy stored in the capacitor.	20EE405.2	L1
3	Give the relationship between magnetic flux and magnetic flux density.	20EE405.3	L2
4	Express Lorentz force equation.	20EE405.4	L1
5	What is time varying field?	20EE405.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6(a)	State and prove stokes's theorem.	6M	20EE405.1	L2
6(b)	Derive the expression for Maxwell's second equation.	6M	20EE405.1	L2

OR

7	Derive the expression for electric field due to an infinite sheet of charge in the xy-plane with uniform charge density ρ_s .	12M	20EE405.1	L2
8 (a)	Three point charges - 1 nC, 4 nC, and 3 nC are located at (0, 0, 0), (0, 0, 1), and (1, 0, 0), respectively. Find the energy in the system.	6M	20EE405.2	L2
8 (b)	List any six properties of materials in electric field.	6M	20EE405.2	L2

OR

9 (a)	Derive the expression for capacitance of coaxial cable.	6M	20EE405.2	L2
9 (b)	Explain Dielectric-Dielectric boundary conditions.	6M	20EE405.2	L2

Toroid whose dimensions are shown in Figure 1 has N turns and carries current I . Determine H inside and outside the toroid.

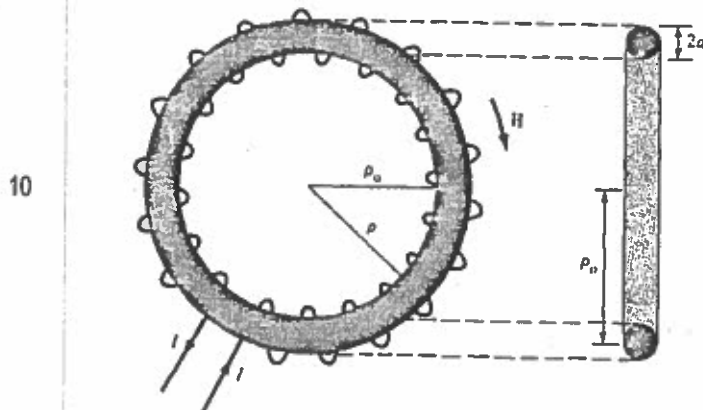


Figure 1

OR				
11	Derive Maxwell's third equation, MFI due to an infinite sheet of current carrying conductor.	12M	20EE405.3	L2

12	Derive an expression for force between two straight long and parallel current carrying conductor.	12M	20EE405.4	L2
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OR

13 (a)	Calculate the self-inductance per unit length of an infinitely long solenoid.	8M	20EE405.4	L2
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13 (b)	The toroidal core of Figure 2 has $\rho_o = 10$ cm and a circular cross section with $a = 1$ cm. If the core is made of steel ($\mu = 1000\mu_o$) and has	4M	20EE405.4	L2
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a coil with 200 turns, calculate the amount of current that will produce a flux of 0.5 mWb in the core.

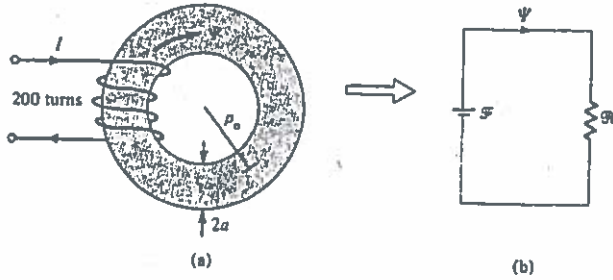


Figure 2

The loop shown in Figure is inside a uniform magnetic field $B = 50a_x$ mWb/m². If side DC of the loop cuts the flux lines at the frequency of 50 Hz and the loop lies in the yz-plane at time $t = 0$, find
 (a) The induced emf at $t = 1$ ms
 (b) The induced current at $t = 3$ ms

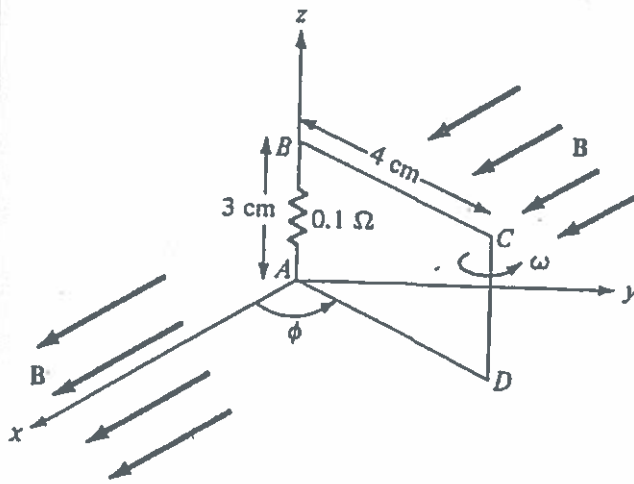


Figure 3

14

12M

20EE405.5

L2

OR

15 (a) Explain statically induced emf.

6M

20EE405.5

L2

15 (b) Express the integral form of Faraday's law.

6M

20EE405.5

L2

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Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	ECE	Academic Year	2021 - 2022
Course Code	20EC405	Test Duration	3 Hrs. Max. Marks 70	Semester	IV
Course	Electronic Circuit Analysis				

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Draw the small signal high frequency CE model of a transistor and list its elements.	20EC405.1	L1
2	Express the current gain for Darlington pair.	20EC405.2	L1
3	Identify any three advantages of negative feedback amplifier.	20EC405.3	L1
4	List any four types of oscillator.	20EC405.4	L1
5	Identify the factors that influences on the selectivity of a single tuned amplifier.	20EC405.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Derive expression for the CE short circuit current gain A_t as a function of frequency.	9M	20EC405.1	L2
6 (b)	Draw Hybrid - π model for a transistor in the CB configuration.	3M	20EC405.1	L2
OR				
7 (a)	State and explain Miller's theorem.	8M	20EC405.1	L2
7 (b)	Draw Hybrid - π model for a transistor in the CE configuration	4M	20EC405.1	L2
8 (a)	Explain three types of coupling methods used in multistage amplifiers	8M	20EC405.2	L2
8 (b)	Draw the circuit diagram of cascade (Two stage RC coupled) amplifier with and without biasing circuit. Also mention the advantages.	4M	20EC405.2	L3
OR				
9	Draw and explain Darlington emitter follower configurations with respect to i. current gain ii. input impedance iii. voltage gain iv. output impedance and compare with emitter follower.	12M	20EC405.2	L2
10	Draw the circuit for voltage shunt amplifier and justify the type of feedback. Also derive the expressions for A_V , β , input and output resistance with feedback	12M	20EC405.3	L2
OR				
11	Draw the circuit for Voltage series feedback amplifier and derive the expressions for A_t and β for the circuit. Also mention the advantages.	12M	20EC405.3	L3
12	Derive the expression frequency of oscillation and condition for sustained oscillations of a FET based RC Phase shift oscillator.	12M	20EC405.4	L3
OR				
13	Describe the operation of Hartley oscillator circuit using bipolar junction transistor with necessary diagrams.	12M	20EC405.4	L3
14 (a)	Describe the operation of class B push pull amplifier and also	9M	20EC405.5	L2

	explain how the crossover distortion is minimized?			
14 (b)	Identify the effects of Harmonic distortions in power amplifiers.	3M	20EC405.5	L2
	OR			
15 (a)	With a neat diagram show how to cascade tuned (staggered) amplifier and explain briefly.	8M	20EC405.5	L2
15 (b)	Describe the features of single tuned amplifier.	4M	20EC405.5	L2

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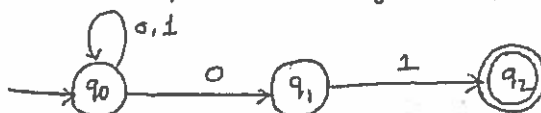
Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	CSE	Academic Year	2021 - 2022
Course Code	20CS405	Test Duration	3 Hrs.	Max. Marks	70
Course	Theory of Computation				
				Semester	IV

Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Differentiate between DFA and NFA.	20CS405.1	L1
2	What is Pumping Lemma?	20CS405.2	L1
3	State Halting Problems.	20CS405.3	L1
4	What is the role of the Syntax Analyzer?	20CS405.4	L1
5	Define Local Optimization.	20CS405.5	L1

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Construct a DFA for accepting the set of all strings with three consecutive 0's.	6M	20CS405.1	L2
6 (b)	Construct DFA equivalent to the NFA given below. 	6M	20CS405.1	L3

OR

7 (a)	Prove that a language L is accepted by some ϵ -NFA if and only if L is accepted by some DFA.	6M	20CS405.1	L2																				
7 (b)	Consider the following ϵ -NFA. Compute the ϵ -closure of each state and find its equivalent DFA. <table border="1" data-bbox="311 1041 622 1299"> <thead> <tr> <th></th> <th>ϵ</th> <th>A</th> <th>b</th> <th>C</th> </tr> </thead> <tbody> <tr> <th>p</th> <td>{q}</td> <td>{p}</td> <td>Φ</td> <td>Φ</td> </tr> <tr> <th>q</th> <td>{r}</td> <td>Φ</td> <td>{q}</td> <td>Φ</td> </tr> <tr> <th>*r</th> <td>Φ</td> <td>Φ</td> <td>Φ</td> <td>{r}</td> </tr> </tbody> </table>		ϵ	A	b	C	p	{q}	{p}	Φ	Φ	q	{r}	Φ	{q}	Φ	*r	Φ	Φ	Φ	{r}	6M	20CS405.1	L3
	ϵ	A	b	C																				
p	{q}	{p}	Φ	Φ																				
q	{r}	Φ	{q}	Φ																				
*r	Φ	Φ	Φ	{r}																				

8 (a)	Give a detailed description of ambiguity in Context-free grammar.	6M	20CS405.2	L2
8 (b)	Let G be a grammar $s \rightarrow OB/1A$, $A \rightarrow O/OS/1AA$, $B \rightarrow 1/1S/OBB$. For the string 00110101 find its leftmost derivation and derivation tree.	6M	20CS405.2	L3

OR

9 (a)	Explain the design of Push Down Automata.	6M	20CS405.2	L2
9 (b)	Construct a equivalent grammar G in CNF for the grammar G1 where $G1 = (\{S, A, B\}, \{a, b\}, \{S \rightarrow bA/aB, A \rightarrow bAA/aS/a, B \rightarrow aBB/bS/b\}, S)$	6M	20CS405.2	L3

10 (a)	Explain the Basic Turing Machine model and explain in one move. What are the actions that take place in TM?	12M	20CS405.3	L2
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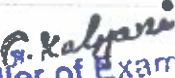
OR

11 (a)	Explain turing machine with model and design turing machine for $a^n b^n / n \geq 1$	12M	20CS405.3	L2
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12 (a)	Explain the role of Lexical Analysis with an example.	6M	20CS405.4	L2
12 (b)	Explain the Context-free grammar writing a grammar.	6M	20CS405.4	L2

OR

13 (a)	Describe LR Parsing with an example.	6M	20CS405.4	L2
13 (b)	Explain LALR Parsers in detail	6M	20CS405.4	L2
14 (a)	Explain the generation variants of Syntax tree three address code.	6M	20CS405.5	L2
14(b)	Explain the Back patching with an example.	6M	20CS405.5	L2
OR				
15 (a)	Describe the Loop Optimization in detail.	6M	20CS405.5	L2
15 (b)	Explain the DAG representation of Basic Blocks.	6M	20CS405.5	L2


Controller of Examinations
NSRIT (A)
Visakhapatnam

Semester End Regular Examination, June, 2022

Degree	B. Tech. (U. G.)	Program	CSE (AI & ML) & CSE (DS)	Academic Year	2021 - 2022
Course Code	20CS302	Test Duration	3 Hrs.	Max. Marks	70
Course	Design and Analysis of Algorithms				
				Semester	IV

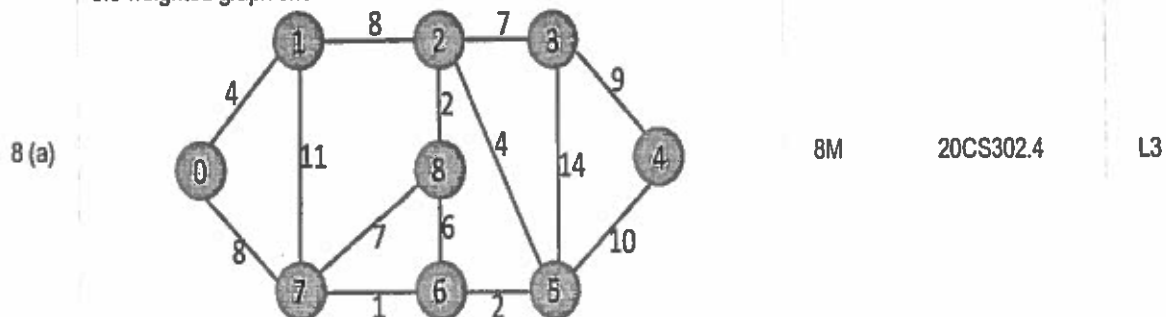
Part A (Short Answer Questions 5 x 2 = 10 Marks)

No.	Questions (1 through 5)	Learning Outcome (s)	DoK
1	Identify an example of a problem that cannot be solved by a brute-force algorithm and justify the answer.	20CS302.1	L1
2	State Master's theorem.	20CS302.2	L1
3	"Prim's algorithm always works correctly on graphs with negative edge Weights" – Justify.	20CS302.3	L2
4	List any four examples containing some well-known problems that are NP-complete when expressed as decision problems.	20CS302.4	L1
5	State the reason for terminating the search path at the current node in the branch and bound algorithm.	20CS302.5	L2

Part B (Long Answer Questions 5 x 12 = 60 Marks)

No.	Questions (6 through 15)	Marks	Learning Outcome (s)	DoK
6 (a)	Write a visualization program for the brute-force string-matching algorithm.	5M	20CS302.1	L2
6 (b)	Design an algorithm to determine the best route for a subway passenger to take from one designated station to another in a well-developed subway system similar to those in such cities as Chennai, Bangalore, and Hyderabad.	7M	20CS302.1	L2
OR				
7 (a)	Describe asymptotic classes with necessary examples and diagrams. Analyze the basic operation, how many times is the basic operation executed, and identify the efficiency class of this algorithm.	6M	20CS302.1	L2
7 (b)	<pre> ALGORITHM Enigma(A[0..n - 1, 0..n - 1]) //Input: A matrix A[0..n - 1, 0..n - 1] of real numbers for i ← 0 to n - 2 do for j ← i + 1 to n - 1 do if A[i, j] = A[j, i] return false return true </pre>	6M	20CS302.1	L2

Using Prim's algorithm, determine the minimum cost spanning tree for the weighted graph shown below.



8 (b) Illustrate the steps for implementing Kruskal's algorithm with an example.

4M 20CS302.3 L3

OR				
9 (a)	Explain how one can generate a Huffman code without an explicit generation of a Huffman coding tree.	6M	20CS302.4	L3
9 (b)	Design an algorithm to solve the 0/1 knapsack problem using the top-down approach of dynamic programming.	6M	20CS302.3	L3
10	Apply quicksort to sort the list E, X, A, M, P, L, and E in alphabetical order.	12M	20CS302.4	L3
OR				
11	Implement an optimal solution to the knapsack instance n=4 objects and the capacity of knapsack m=15, profits (10, 5, 7, 11) and weight are (3, 4, 3, 5).	12M	20CS302.4	L3
12	State and explain Cook's theorem.	12M	20CS302.3	L2
OR				
13 (a)	Classify the three types on satisfiability problem (SAT) with an example.	6M	20CS302.3	L2
13 (b)	Compare NP-hard and NP-completeness.	6M	20CS302.3	L2
14 (a)	Give the general principle of backtracking.	4M	20CS302.3	L2
14 (b)	Write an algorithm for the sum of subset problems using backtracking. Also, solve the following instance of sum of subset problem: S = {1, 5, 2, 7} with d = 8.	8M	20CS302.5	L3
OR				
Solve the travelling salesman problem using branch and bound				
15	$\begin{pmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{pmatrix}$	12M	20CS302.5	L3

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