R19

M.TECH I SEM

REGULAR & SUPPLEMENTARY EXAMINATIONS

MARCH 2024

Subject Code: 19MSE1TH01

M.Tech - I Semester Regular & Supple Examinations, March-2024
ADVANCED ENGINEERING MATHEMATICS
(SE)

Time: 3 hours **Max Marks: 60**

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Given below is the distribution of 140 candidates obtaining marks X or higher in a certain examination (all marks are given in whole numbers) :

X	10	20	30	40	50	60	70	80	90	100
c.f.	140	133	118	100	75	45	15	9	2	0

Calculate the mean, median and mode of the distribution. (9M)

(b) Derive the least square equation for fitting curve of the type $y=ax^b$ to a set of n points (3M)

2. (a) Fit a parabola of second degree $Y = a + bX + cX^2$ to the following data: (6M)

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	6.3

(b) Calculate the coefficient of correlation between X and Y for the following: (6M)

X	1	3	4	5	7	8	10
Y	2	6	8	10	14	16	20

3. (a) Using the method of separation of variables, Solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$, given that u(0,y)=8e^{3y} (4M)

(b) A tightly stretched string of length l with fixed ends is initially in equilibrium position. It is set vibrating by giving each point a velocity $V_0 Sin(\pi x/l)$ Find the displacement $y(x, t)$. (8M)

4. Given the values of $u(x, y)$ on the boundary of the square in the figure, evaluate the function $u(x, y)$ satisfying the Laplace equation $\nabla^2 u=0$ at the pivotal points of this figure. (12M)

5. Solve $du/dt=d^2u/dx^2$ in $0 < x < 5$, $t \geq 0$ given that $u(x, 0) = 20$, $u(0, t) = 0$, $u(5, t) = 100$. Compute u for the time-step with $h = 1$ by Crank-Nicholson method. (12M)

6. Apply the Gauss-Seidel iteration (4 steps) to the system $10x_1+x_2+x_3=6, x_1+10x_2+x_3=6$ and $x_1+x_2+10x_3=6$ (12M)

7. (a) Solve $x^3 d^3y/dx^3 + 2x^2 d^2y/dx^2 + 2y=10(x+1/x)$. (6M)

(b) Solve $d^2y/dx^2 + y=x^2 e^{3x}$ (6M)

8. Using Galerkin's method, solve the boundary value problem $y''=3x+4y$, $y(0)=0$, $y(1)=1$ Compare your approximate solution with the exact solution. (12M)

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Subject Code: 19MSE1TH02
M.Tech - I Semester Regular & Supple Examinations, March-2024
THEORY OF ELASTICITY
(SE)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Explain the concept and assumptions involved in theory of elasticity?
   (b) Explain about Strain components in polar co-ordinates.

2. Prove that the following are Airy's Stress functions and examine the stress distribution represented by them;

   i. $\varphi = Ax^2 + By^2$
   ii. $\varphi = Bx^3$
   iii. $\varphi = A(x^4 - 3x^2y)$

3. (a) Write a short notes on following a) octahedral stresses. b) Stress invariants
   (b) Explain in detail about the principle of super position.

4. Determine principal stresses and principal strains for the state of stress at a point given below in kg/cm^2

$$\tau_{ij} = \begin{bmatrix} 200 & 30 & 40 \\ 30 & 100 & 20 \\ 40 & 20 & 50 \end{bmatrix}$$

5. Explain how about Fourier series can be applied for two dimensional problem under gravity loading.

6. (a) Explain with an example stresses in rotating discs and cylinders
   (b) Explain about stress concentration

7. An elliptical shaft of semi axes a = 0.05 m , b = 0.0025 m, and G = 80 GPa is subjected to a twisting moment of 1200π N.m. Determine the maximum shearing stress and the angle of twist per unit length.

8. Obtain expression for torque and angle of twist of an elliptical shaft subjected to uniform torsion and draw contour lines for the wrapped cross section?

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Subject Code: 19MSE1TH03

M.Tech - I Semester Regular & Supple Examinations, March-2024
MATRIX ANALYSIS OF STRUCTURES
(SE)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. Using flexibility method, analyse the beam shown in Fig.1. Neglect axial deformations and assume the flexural rigidity is constant.
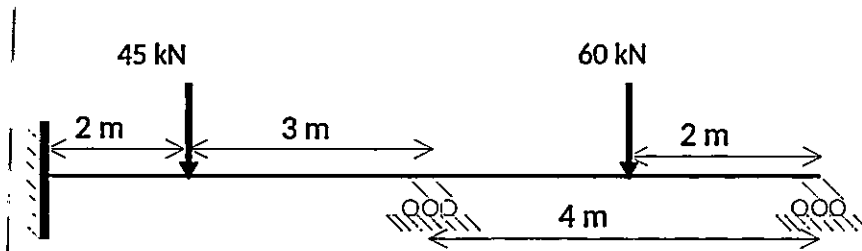

Fig.1

2. (a) Explain the static and kinematic indeterminacies with suitable examples.
   (b) Explain the salient features of flexibility method of analysis.

3. Analyse the beam shown in Fig.2. using stiffness method.
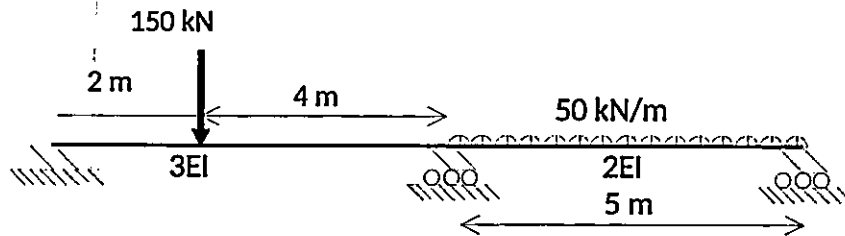

Fig.2

4. Analyse the rigid jointed frame shown in Fig. 3. Also draw the bending moment diagram. Neglect axial deformations.
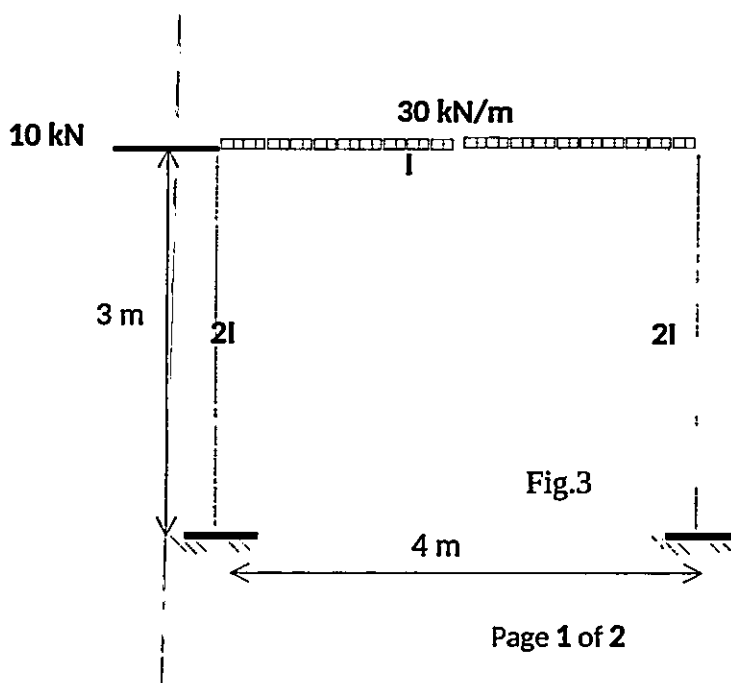

Fig.3

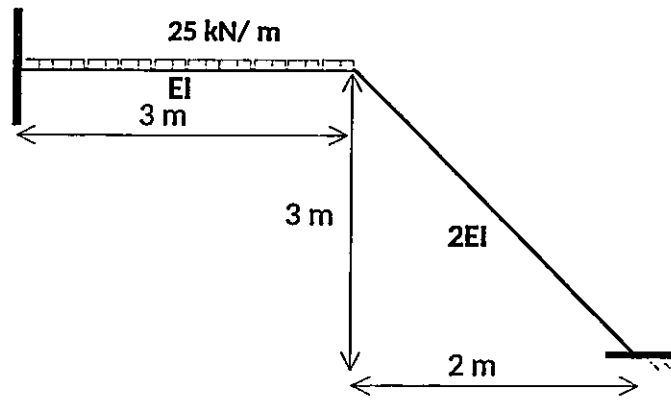5. Analyse the frame shown in Fig. 4. Neglect axial deformations.

Fig.4

6. Derive the stiffness matrix of a space frame element.

7. (a) Explain the complete structure of a stiffness analysis program using subroutines.
   (b) Explain the assembly of element stiffness matrices.

8. (a) Explain the step-by-step procedure for the analysis of a space truss.
   (b) Explain the importance of a stiffness transformation matrix and derive the same.

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Subject Code: 19MSE1TH04

M.Tech - I Semester Regular & Supple Examinations, March-2024
ADVANCED STRUCTURAL ENGINEERING
(SE)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) Define dynamic and analyze the structure to a dynamic loading.   [6]
   (b) Write short notes on   i) Degrees of freedom system, ii) Simple harmonic motion   [6]

2. (a) Write short notes on logarithmic decrement.   [4]
   (b) Derive expression for response of a SDOF system subjected to free vibration.   [8]

3. (a) Write short notes on dynamic equilibrium.   [4]
   (b) Formulate the equation of motion for un-damped free vibrations of MDOF system.   [8]

4. Determine the natural frequencies and mode shapes of the given(Fig.1) MDOF system?   [12]
   Take EI=5x106 N-m 2 for all the columns shown in Fig.1.

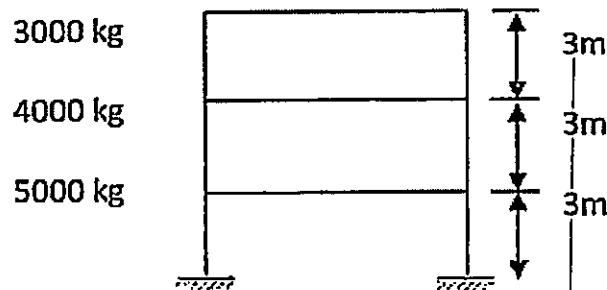|	
3000 kg	3m
4000 kg	3m
5000 kg	3m

Fig.1

5. Derive the natural frequency and mode shapes for uniform beam having both end   [12]
   simply supported.

6. Derive the solution for the differential equation of undamped free flexural vibration of an [12]
   one dimensional distributed mass system.

7. A single degree of freedom system having a mass of 2.5 m is set into motion with a viscous   [12]
   damping and allowed to oscillate freely. The frequency of oscillation is found to   be 20 Hz,
   and measure of the amplitude of vibration shows two successive amplitude to   be 6 mm and
   5.5 mm. Estimate the viscous damping co-efficient.

8. (a) Discuss about any two Mass Matrix Construction Methods.   [6]
   (b) Explain about the free and forced vibration of continuous systems.   [6]

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NEC
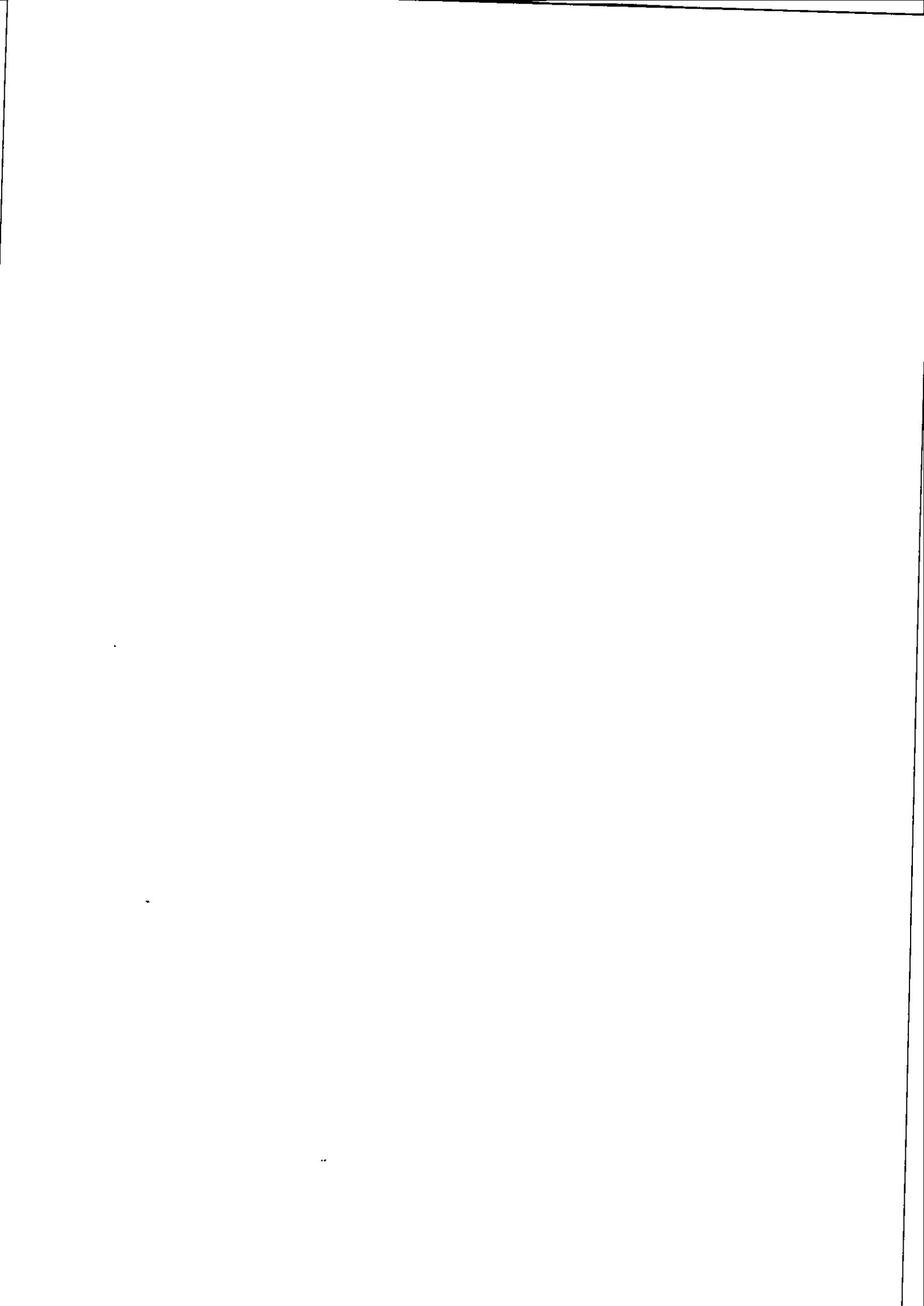
Subject Code: 19MSE1PE07

M.Tech - I Semester Regular & Supple Examinations, March-2024
### REPAIR AND REHABILITATION OF STRUCTURES
(SE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) what are the causes of distress and deterioration of concrete ?   [6]
   (b) As a site engineering, what are the factors you would check during the day of concreting [6]
   to assure quality in construction? Explain it.

2. (a) How do you repair a structure distressed due to corrosion? Describe in detail.   [6]
   (b) Explain about temperature and their causes in concrete.

3. (a) Define maintenance. Explain the importance of protection & maintenance.   [6]
   (b) What is the need of structural health monitoring? Explain the basic components of   [6]
   structural health monitoring.

4. Explain in detail   [4 x 3]

i)   Expansive cement
ii)   Polymer concrete
iii)   Ferro cement
iv)   Fiber reinforced concrete.

5. (a) Explain with neat sketch how to do jacketing and strengthening to a column.   [6M]
   (b) Explain how cracks may be sealed by using Epoxy injection resin.   [6M]

6. (a) state any four non – conventional materials required for repairs.   [6M]
   (b) Write short note on shoring and underpinning techniques.   [6M]

7. Explain in detail engineered demolition techniques for dilapidated structures.   [12M]

8. (a) when do you retrofit structures ?   [6M]
   (b) Classify and explain the use of different techniques for repair.   [6M]

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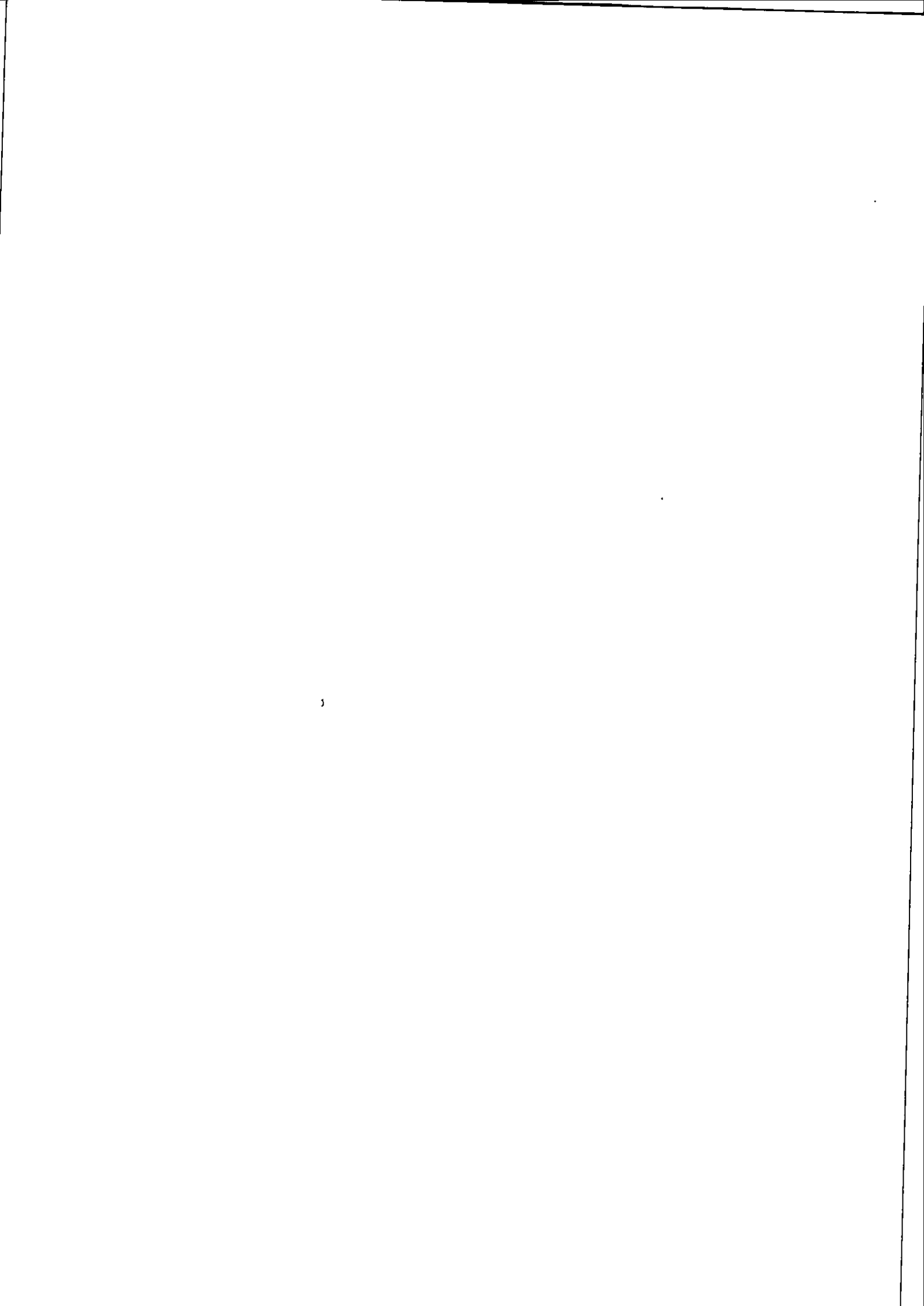
Subject Code: 19MSE1PE10

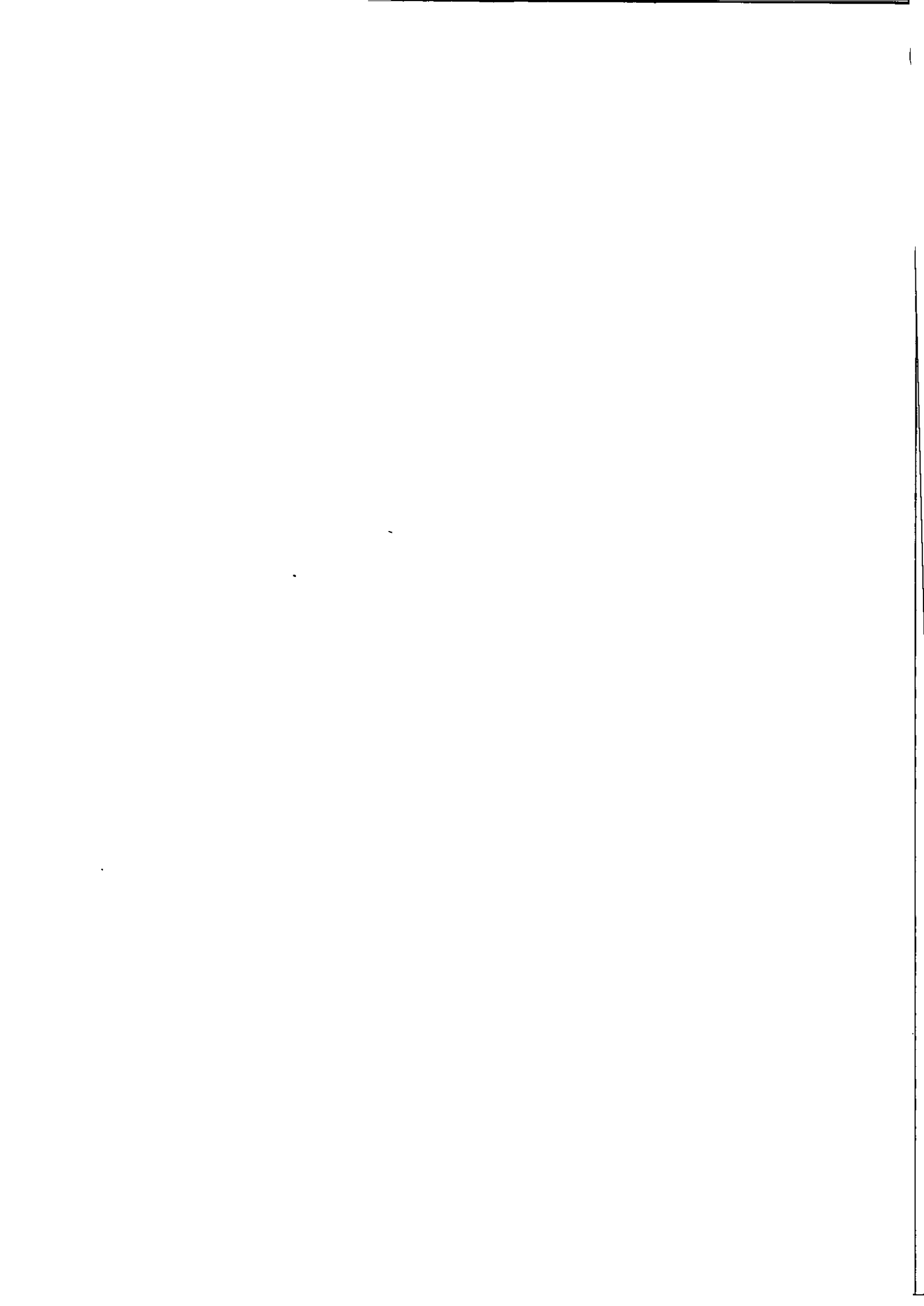## M.Tech - I Semester Regular & Supple Examinations, March-2024
ADVANCED CONCRETE TECHNOLOGY
(SE)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) Explain hydrated structure of cement with neat sketch.
   (b) Write the chemical composition of OPC? Discuss the importance of each compound

2. (a) Explain about Ferro cement materials and its mechanical properties
   (b) Write the design of Ferro cement in tension?

3. (a) What is creep and shrinkage of concrete? List the factors affecting creep and shrinkage of Concrete.
   (b) Discuss about Modulus of elasticity in concrete?

4. What is Admixture? Explain the classification of admixtures? What are the different applications of admixtures?

5. (a) What is Mix Design? Explain in detail the various factors governing the selection of mix Proportion?
   (b) Write the importance and applications of Fly ash

6. Explain various factors influencing workability of concrete? Describe any one test procedure used for evaluating workability?

7. (a) Explain when do you go NDT?

   (b) Write about Ultrasonic Pulse Velocity test with sketch

8. Write about
a) Lightweight concrete (b) Roller compacted concrete (c) High strength concrete
(d) polymer concrete

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Subject Code: 19MPI1TH01
M.Tech - I Semester Regular & Supple Examinations, March-2024
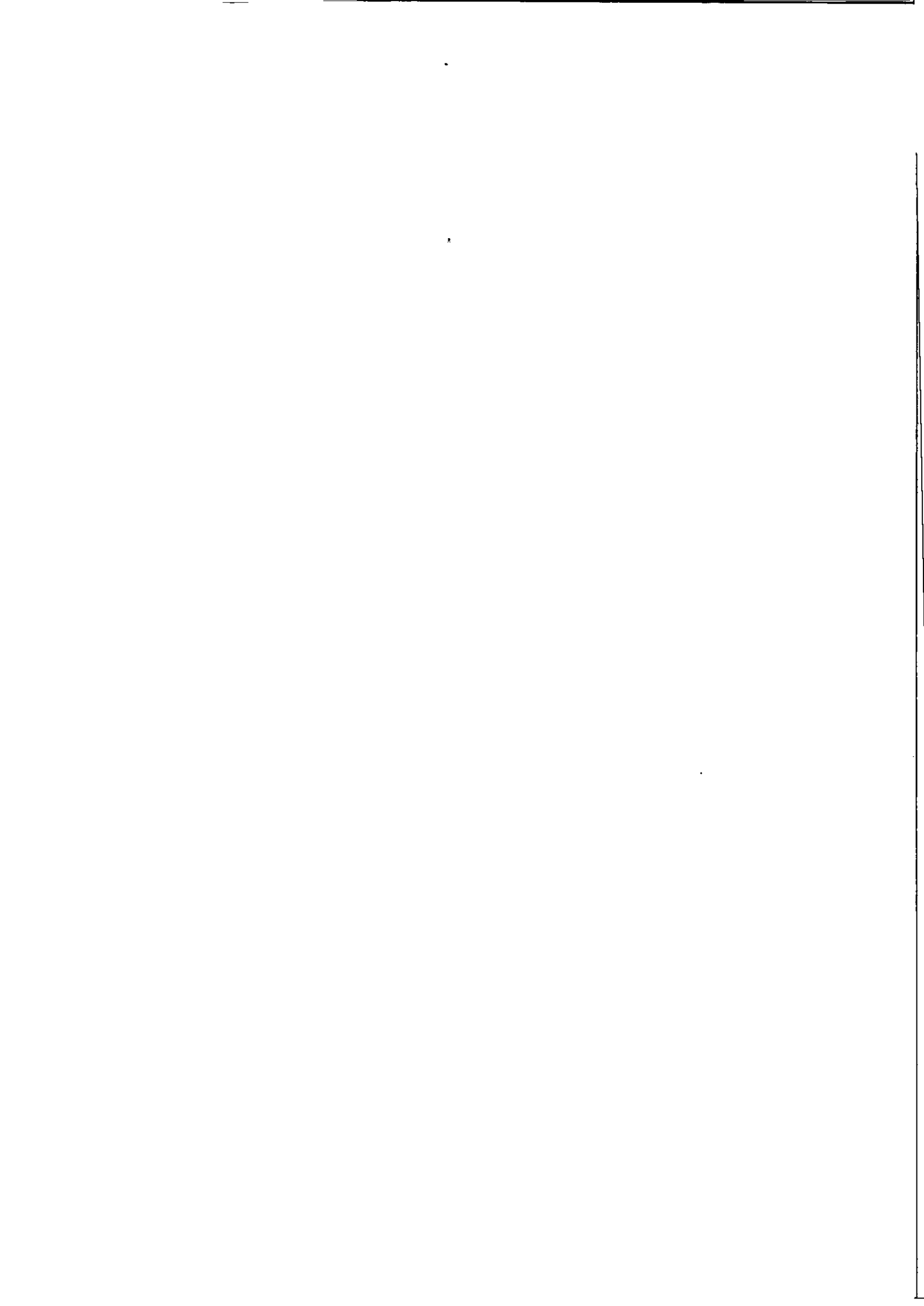### ELECTRICAL MACHINE MODELLING AND ANALYSIS
(PID)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) What is generalized machine theory? What are the restrictions of generalized machine theory?

   6 M

   (b) Describe the modelling of three phase synchronous machine with damper bars. 6M

2. (a) Explain the transfer function analysis of a separately excited DC motor. 6M
   (b) Explain the mathematical model of a DC series motor. 6M

3. (a) Starting from fundamentals obtain the matrix form of a D.C. series motor? 6M
   (b) Develop machine model for a d.c. compound motor, with the help of neat schematic diagram and primitive diagram. Arrange the final equations in state space form? 6M

4. (a) Explain the method for two phase to three phase transformation. 6M
   (b) Describe some applications where two phase to three phase transformation is required. 6M

5. (a) What are the commonly used induction machine models? Explain the relative importance of them.   6M
   (b) Explain the rotor reference frame model of a three phase induction machine 6M

6.   Draw the basic circuit model for a 3-phase induction motor for stator as well as rotor and obtain voltage equations in the form of matrices in terms of stator and rotor currents?   12M

7.   From the basic equation, derive the expression for voltages in direct axis, quadrature axis, field current and zero sequence voltage for a synchronous machine? 12M

8. (a) From the basic equation, Obtain the dynamic model of switched reluctance motor? 6M
   (b) Explain the modelling of Permanent magnet Brushless DC motor. 6M

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Subject Code: 19MPI1TH02

M.Tech - I Semester Regular & Supple Examinations, March-2024
DISTRIBUTED GENERATION AND ITS IMPACTS
(PID)

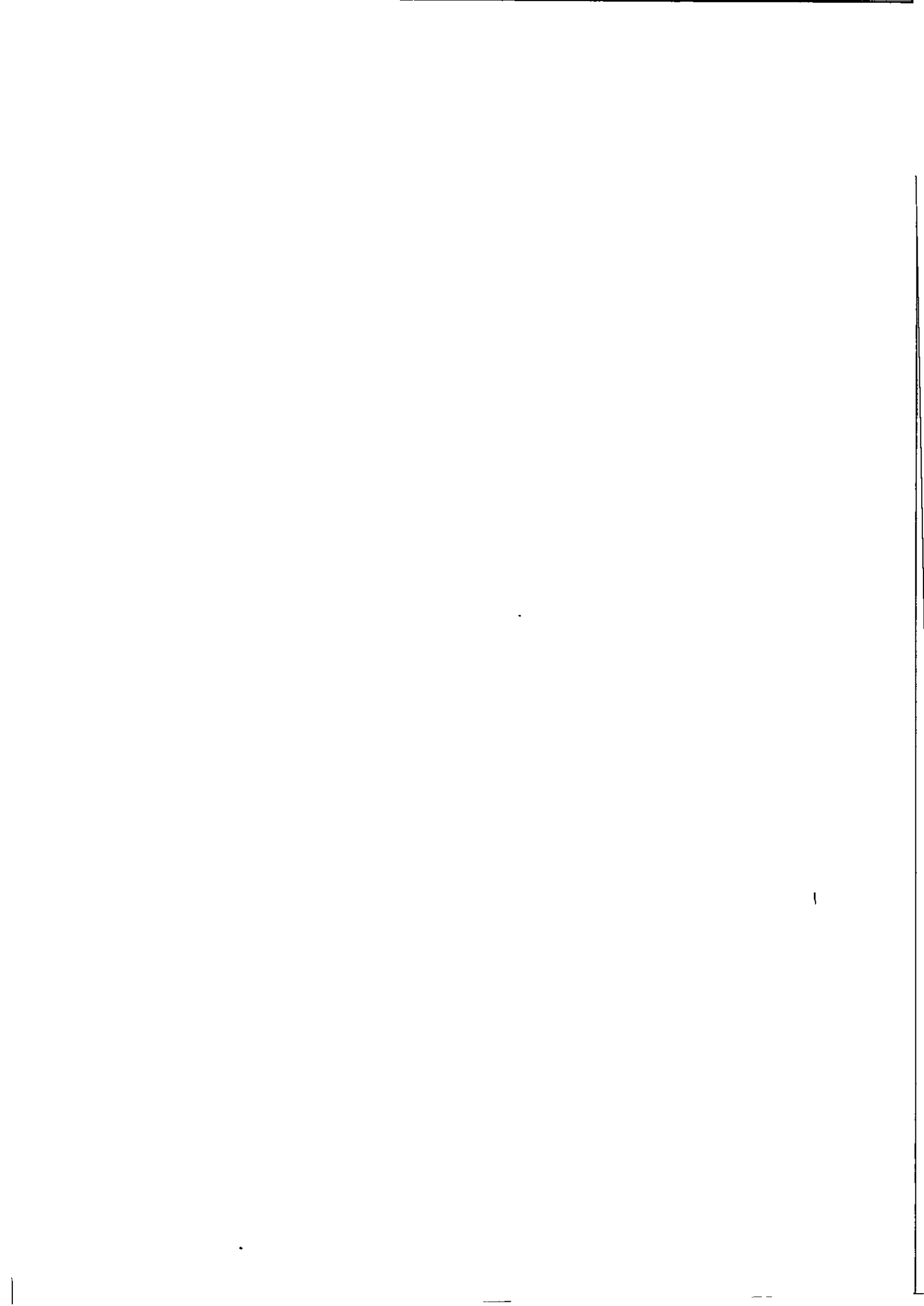Time: 3 hours   Max Marks: 60
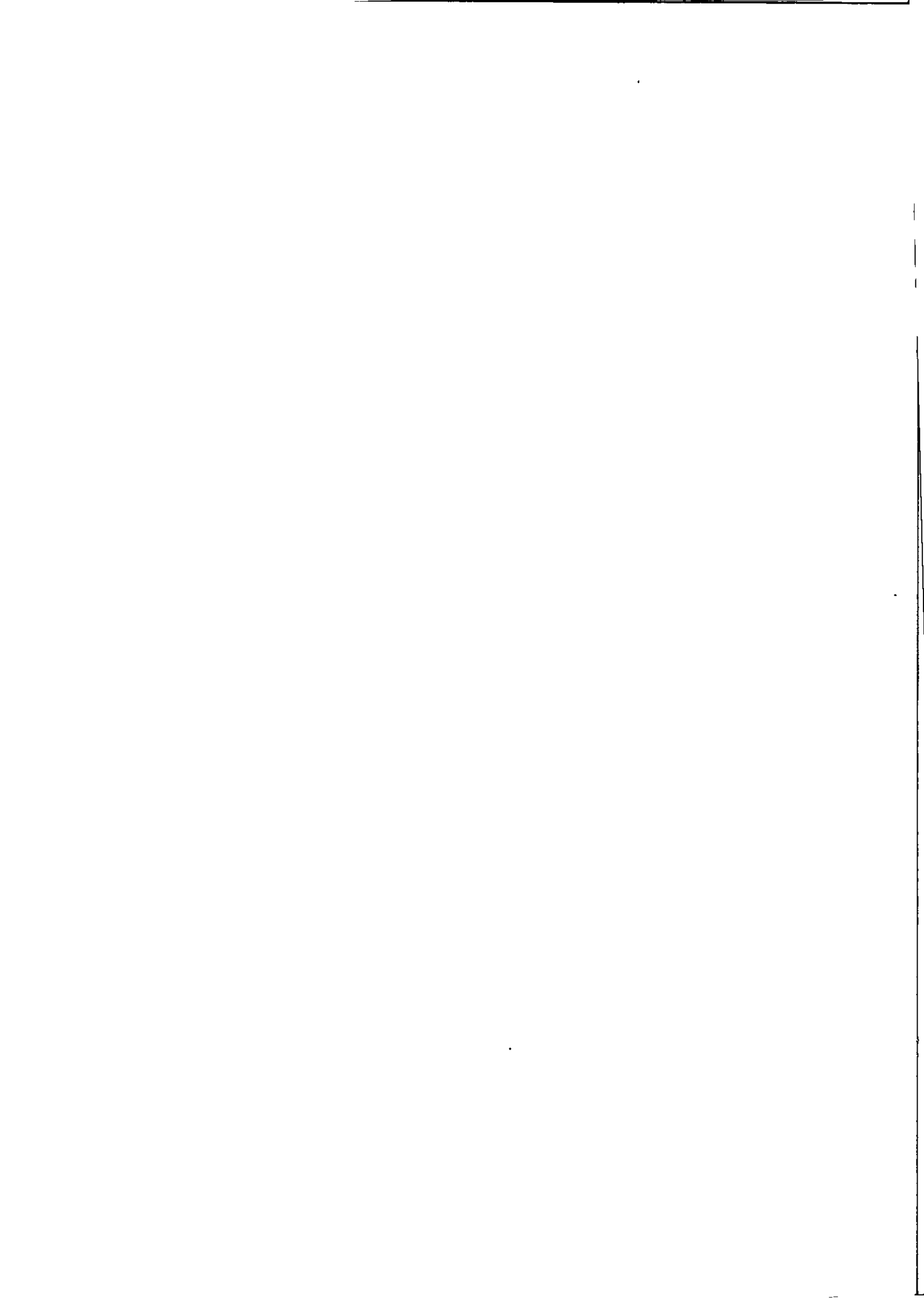
Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Elucidate about Renewable sources of energy and also give the importance of renewable energy economics.
   (b) Discuss about modern electronic controls of power systems.   [6M+6M]

2. (a) Illustrate the electrical layout of a typical wind farm in detail with the help of single line diagram.   [12M]

3. (a) Enumerate various methods to track maximum power point of solar PV systems. Also explain about the techniques of P&O.
   (b) Write short notes on parameters for photovoltaic panels.   [8M+4M]

4. (a) Highlight the difference between Fuel cell and Battery.
   (b) Describe the working principle of fuel cell with reference to $H_2 - O_2$ cell.   [4M+8M]

5. (a) Explain about Pumped hydroelectric energy storage.   [12M]

6. (a) Explain in detail about different interconnection technologies.
   (b) Discuss about the interconnection examples for alternative energy sources.   [8M+4M]

7. (a) Explain in detail about DG control and Power injection.   [12M]

8. (a) What are biomass conversion technologies?
   (b) Explain various conversion technologies and products with a neat schematic diagram.
                                                                                 [2M+10M]

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M.Tech - I Semester Regular & Supple Examinations, March-2024
ANALYSIS OF POWER ELECTRONIC CONVERTERS AND INVERTERS
(PID)

Time: 3 hours   Max Marks: 60
Answer any FIVE questions.   All questions carry EQUAL marks

1 (a) Discuss the effect of source inductance on the performance of single phase fully controlled converter and also derive an expression for output voltage.
   (b) A 1phase fully controlled bridge is operated with a resistive load R=10Ω, the input voltage to the bridge is 230 V. Calculate the following (i) Average load voltage (ii) RMS load voltage (iii) From factor and ripple factor (iv) Average load current.

2 (a) With necessary circuit and waveforms, explain the principle of operation of 3phase fully controlled bridge converter feeding RL load and also write the expression for the average output voltage.
   b) Three phase fully controlled coverter is connected to a supply voltage of 230 volt per phase and frequency is 50Hz.The source inductance is 4mH.The load current on dc side is constant at 20 A. If the load consists of a dc source voltage of 400V an internal resistance of 1ohm,compute the following : (i) Firing angle (ii) Overlap angle

3 a) With necessary circuit and waveforms, explain the principle of operation of step down DC to DC converter with RL load.
   b) Draw the circuit of CUK converter and explain its working principle with necessary waveforms in detail.

4 a) Draw the load current waveforms PWM control based1- phase ac voltage controller With R and R-L loads, Briefly describe its operation?
   b) A three phase ac voltage controller feeds a balanced star connected R-L load. The value of resistance is 10 _ and inductance is 6.5mH. The controller is fed from a 3- phase supply of 400V, 50Hz. Determine for a firing angle of 300, the values of i)rms load current ii) rms load voltage iii) Power factor.

5 a) Describe the operating principle of 3phase -1 phase cycloconverter with appropriate circuit and waveform.
   b) With neat sketches, explain the operation of single phase dual converter in circulating current mode.

6 a) Analyse the Soft switching concepts in DC-DC Converters
   b) Briefly explain about ZVS & ZCS concepts.

7 a)Explain the single PWM, multiple PWM, sinusoidal PWM and 60 Degree PWM
   b) Explain the Third Harmonic injection PWM and modified sinusoidal PWM techniques

8 Deduce the steady state analysis of single stage boost power factor corrected 1-phase rectifier

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Narasaraopeta Engineering College (Autonomous)
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NEC

Subject Code: 19MPI1TH04

M.Tech - I Semester Regular & Supple Examinations, March-2024
FLEXIBLE AC TRANSMISSION SYSTEM
(PID)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1   a) Discuss the various categories of FACTS controllers in brief.

   b) Describe the parameter trade-off of high power devices.

2   a) Explain the three phase full-wave bridge converter with necessary waveforms.

   b) Enumerate the relative merits and demerits of current source converters over voltage source converters

3   a) Discuss the improvement of voltage stability using shunt compensation.
   b) Write a comparison between thyristor controlled reactor and thyristor switched reactor.

4   a) Write a comparison between STATCOM and SVC in the following
     (i) V-I characteristics (ii) transient stability.
   b) What is meant by power oscillation damping? Explain its functional control
     implementation.

5   a) Explain the operation of basic GTO-controlled series capacitor.
   b) Discuss the configuration and operation of TCSC.

6   a) Describe the various transmission control capabilities of UPFC.
   b) Explain the basic two-converter Interline Power Flow Controller scheme.

7   a) Explain various loading capability limits in power flow systems.
   b) Describe relative importance of different types of controllers.

8   a) Describe the basic thyristor switched capacitor and its operation.
   b) Explain the power oscillation damping in shunt compensation.

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Subject Code: 19MPI1PE05

M.Tech - I Semester Regular & Supple Examinations, March-2024
POWER SEMICONDUCTOR DEVICES AND PROTECTION
(PID)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Explain in detail the characteristics of ideal and real switching devices   [8M]
   (b) Classify the power switching devices.   [4M]

2. (a) Explain the switching characteristics of power diode.   [6M]
   (b) Explain the classification of various diodes.   [6M]

3. (a) Explain in detail i-v characteristics and switching characteristics of a power transistor. [8M]
   (b) Explain about fast recovery diodes.   [4M]

4. (a) Explain in detail about the transfer and output characteristics of IGBT.   [6M]
   (b) Explain in detail about the functions and different types of snubber circuits.   [6M]

5. (a) Explain in detail about the protection of power semi-conductor devices from short circuit currents and faults.   [6M]
   (b) Give details of construction and explain device physics of MOSFET.   [6M]

6. (a) Explain the thermal model of a device and obtain its equivalent electrical circuit.   [6M]
   (b) Explain the sizing of a heat sink based on device characteristics.   [6M]

7. (a) Explain in detail about hysteresis and eddy current loss in magnetic core.   [7M]
   (b) Explain the inductor design procedure.   [5M]

8. (a) Explain di/dt and dv/dt protection techniques of power devices.   [7M]
   (b) Compare the power devices based on power handling capability, frequency of operation and driver circuit.   [5M]

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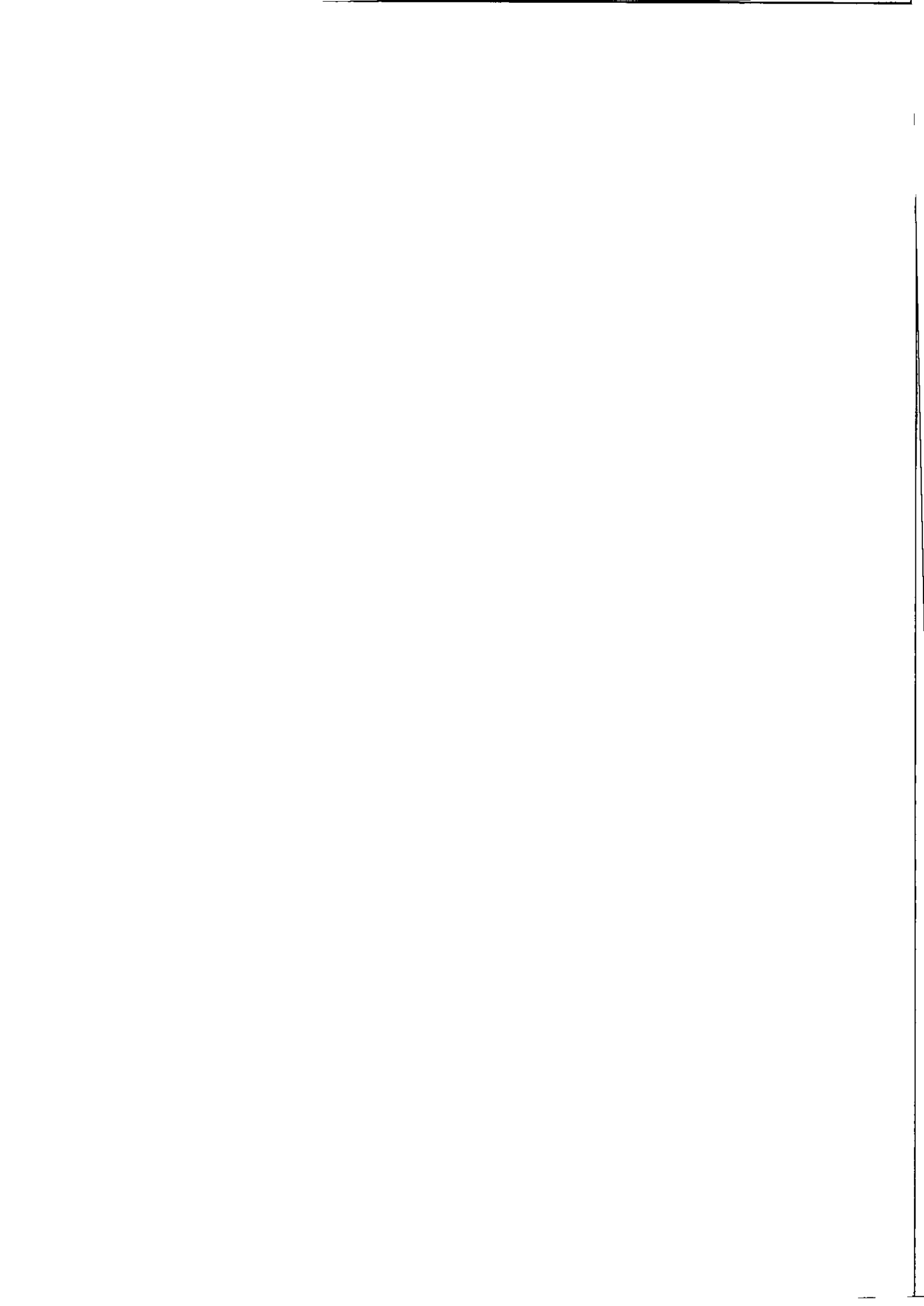
I M.Tech I Semester Regular & Supple Examinations, March-2024

Sub Code: 19MPI1PE09 **SPECIAL MACHINES AND CONTROL**

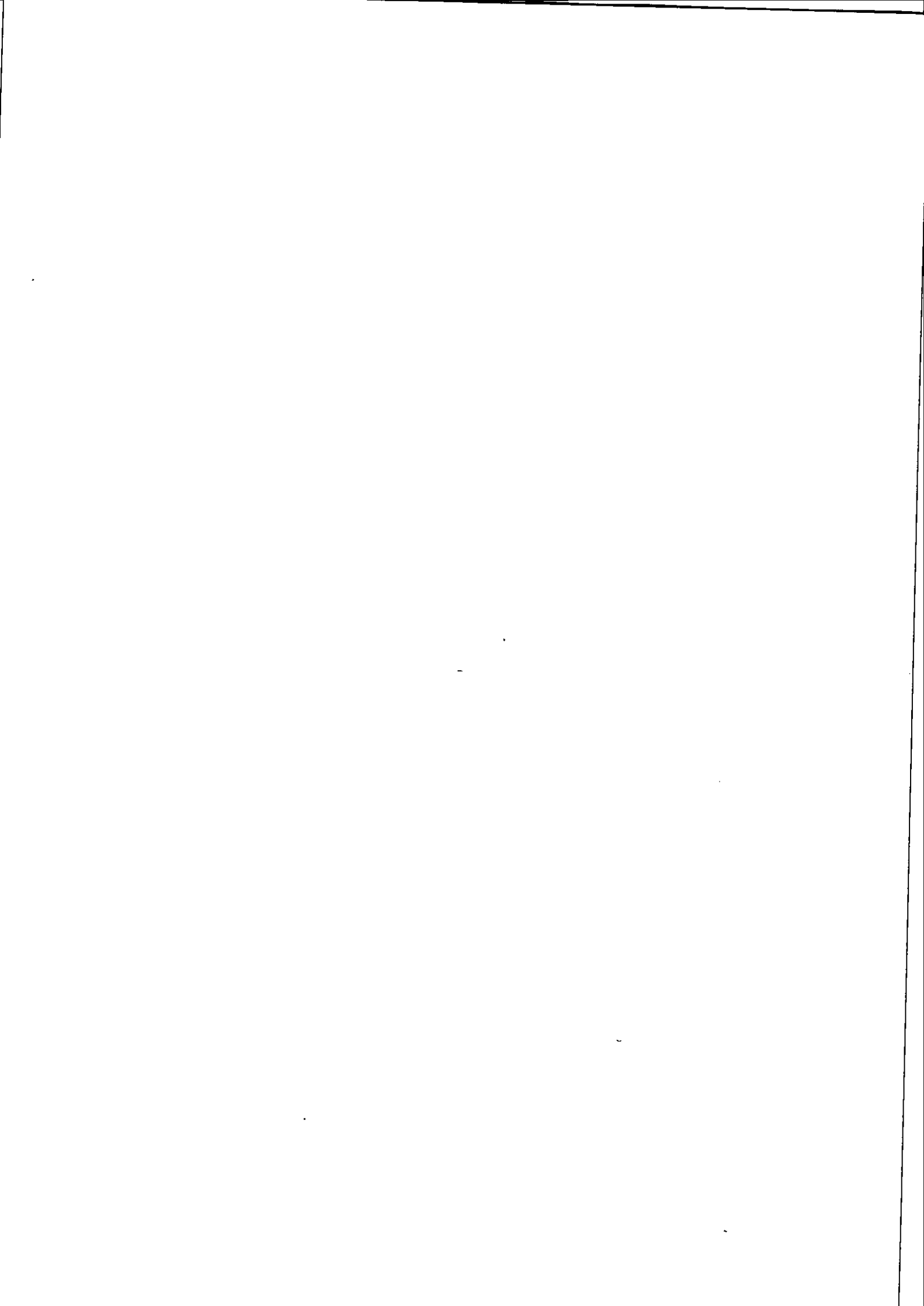Time: 3 hours   (EEE-P&ID)   Max. Marks: 60

Note: Answer Any **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No		Questions	KL	CO	Marks
1	a)	Draw and explain the drive circuits and their performance characteristics for stepper motors.	3	CO1	[6M]
	b)	Explain different modes of excitation torque production in variable reluctance stepping motor	3	CO1	[6M]
2	a)	Draw and discuss the shape of phase inductance of a Switched Reluctance motor with respect to rotor position.	2	CO2	[6M]
	b)	Derive the expression for torque produced by Switched reluctance motors.	2	CO2	[6M]
3	a)	Sketch and discuss the torque speed characteristics of a permanent magnet DC motor.	2	CO3	[6M]
	b)	What is a commutator? What is its need in electrical machines? Compare between mechanical and electronic commutators.	2	CO3	[6M]
4	a)	Explain the vector control scheme of permanent magnet synchronous motor.	3	CO4	[6M]
	b)	Discuss current control scheme in permanent magnet Synchronous motors.	3	CO5	[6M]
5	a)	Explain the constructional features of a Servo motor with its principle of operation.	3	CO4	[6M]
6	a)	Give the analysis of Linear induction motor in terms of electromagnetic equations.	3	CO3	[6M]
	b)	Explain the control strategy of a switched reluctance motor with necessary waveforms.	3	CO4	[6M]
7	a)	Discuss the applications of linear induction motors	2	CO3	[6M]
	b)	Explain the torque speed characteristics of a permanent magnet synchronous motor.	2	CO2	[6M]
8	a)	List and discuss various advantages and applications of switched reluctance motors.	2	CO3	[6M]
	b)	Draw and explain the static and dynamic characteristics of stepper motors.	3	CO3	[6M]

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KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks

Subject Code: 19MCS1TH01

M.Tech - I Semester Regular & Supple Examinations, March-2024
ADVANCED DATA STRUCTURES AND ALGORITHM ANALYSIS
(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Write a program to implement Doubly Linked List
   (b) What are the disadvantages of a Queue? How can we overcome them using circular Queue. Explain with an example

2. (a) Implement Insertion Sort Technique on the following 2,1 6, 89, 3, 65, 92, 18
   (b) Compare and illustrate Linear search and Binary search algorithms with an example.

3. (a) Write the DFS algorithm and derive its complexity. List out the applications of DFS algorithm.
   (b) How do you evaluate Postfix expression? Explain it with an example.

4. Explain separate chaining and open addressing in detail?

5. What is the necessity of Priority Queues? Explain its characteristics and memory representation.

6. Draw a binary search tree when the following keys are inserted in order 43, 75, 19, 36, 8, 62, 49, 84, 12, 18, 29. How can a binary search tree be used for sorting the keys? Explain about the procedure for deleting a node having 2 subtrees ; in Binary search tree with an example.

7. What is the balancing condition of an AVL tree height factor? How is rebalancing done in AVL trees during insertion and deletion of elements? Explain with an example

8. Start with an empty red black tree and insert the following keys in the given order: 20, 10, 5, 30, 40, 57, 3, 2, 4, 35, 25, 18, 22, 21. Draw the figures depicting your tree immediately after insertion and following the rebalancing rotation or color change. Label all nodes with their color and identify the rotation type.

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Narasaraopeta Engineering College (Autonomous)
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NEC

Subject Code: 19MCS1TH02

M.Tech - I Semester Regular & Supple Examinations, March-2024
COMPUTER ORGANIZATION AND OPERATING SYSTEMS
(CSE)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) Draw and explain block diagram of Computer.
   (b) What is Register Transfer Language . Explain Arithmetic micro operations.

2. Explain Instruction Formats with examples.

3. (a) Explain Asynchronous Data Transfer with example.
   (b) Explain Asynchronous serial transfer.

4. Explain different modes of data transfer .

5. (a) Draw and explain Process state diagram.
   (b) Explain services and functions of operating system.

6. Distinguish between deadlock prevention and deadlock avoidance. Explain Bankers algorithm for deadlock avoidance.

7. (a)Explain Disk Scheduling algorithms.
   (b) Compare and Contrast internal segmentation and external segmentation.

8. (a) What is virtual memory? Explain demand paging.
   (b) Discuss page fault ratio and explain optimal page replacement algorithm.

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NEC

Subject Code: 19MCS1TH03

M.Tech - I Semester Regular & Supple Examinations, March-2024
DATABASE MANAGEMENT SYSTEMS
(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) Discuss the main characteristics of the database approach and how it differs from traditional file systems. [6M]

   (b) What is the difference between the two-tier and three-tier client/server architectures? [6M]

2. (a) Design an E-R diagram for an Employee database with at least four entities and considering all constraints. [6M]

   (b) Discuss the entity integrity and referential integrity constraints. Why each constraint considered important? [6M]

3. (a) Explain DDL and DML Statements in SQL with Examples. [6M]

   (b) What are nested queries? What is correlation in nested queries? Explain with an example. [6M]

4. (a) Illustrate redundancy and the problems that it can cause. Give examples of INSERT, DELETE and UPDATE anomalies. [6M]

   (b) Give a set of Functional Dependencies for the relation schema R(A,B, C,D) with primary key AB under which R is in 2NF but not in 3NF. [6M]

5. (a) What are the ACID properties? Define atomicity, consistency, isolation, and durability and illustrate them through examples. [6M]

   (b) Discuss concurrency control with time stamping method. [6M]

6. (a) What is a heap file? How are pages organized in a heap file? Discuss list versus directory organizations. [6M]

   (b) What is the order of a B+ tree? Describe the format of nodes in a B+ tree. Why are nodes at the leaf level linked? [6M]

7. What is the need for normalization? Explain First, Second and Third normal forms with examples. [12M]

8. (a) Discuss various types of JOIN operations in SQL. [6M]

   (b) Explain Specialization and Generalization in E-R modeling. [6M]

Subject Code: 19MCS1TH04

M.Tech - I Semester Regular & Supple Examinations, March-2024
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(CSE)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) Obtain PCNF for the Propositional function $(\sim A \vee B) \rightarrow (A \leftrightarrow \sim B)$?

   (b) Prove that $(P \rightarrow Q) \rightarrow Q \Leftrightarrow (P \vee Q)$ without constructing the Truth Table?

2. (a) Prove $\forall x(P(x) \rightarrow R(x))$, $(\exists x)((P(x) \wedge Q(x)) \Rightarrow (\exists x)((R(x) \wedge Q(x))$

   (b) Symbolize the following statements:
   - i) all men are good
   - ii) no men are good
   - iii) some men are good
   - iv) some men are not good

3. (a) Draw the Hasse diagram for the power set $(P(S), \leq)$, where S={p.q.r}

   (b) Verify the following relation R on X = {1, 2, 3, 4} is an equivalence relation or not?
   Given R = {(1, 1), (1, 4), (4, 1), (2, 2), (2, 3), (3, 4), (3, 3), (3, 2), (4, 3), (4, 4)}

4. (a) Explain isomorphism of two graphs with suitable example?

   (b) Explain BFS algorithm with suitable example?

5. (a) State and prove multinomial theorem?

   (b) Determine the coefficient of $x^3 y^3 z^2$ in the expansion of $(2x - 3y + 5z)^8$?

   (c) Let L be a lattice. Then prove that $a \wedge b = a$ if and only if $a \vee b = b$?

6. (a) Find the solution of non-homogeneous relation $a_n = 4a_{n-1} - 4a_{n-2} + (n^2 + 1)2^n$, $a_0=0$ and $a_1=1$?

   (b) Solve the recurrence relation $a_n - 5a_{n-1} + 8a_{n-2} - 4a_{n-3} = 0$ for $n \geq 3$ using generating function?

7. (a) In how many ways can you select at least one king, if you choose five cards from a Deck of 52 cards?

   (b) Explain the kruskal's algorithm for finding Minimal Spanning Tree with an example?

   (c) Show that the complete graph K_5 and complete bipartite graph $K_{3,3}$ are not planar?

8. (a) If A={1, 2,3,4}, B{w, x, y, z} and f={(1,w),(2,x),(3,y),(4,z)} then prove that f is both one-to- one and onto?

   (b) Show that the following premises are inconsistent.
   - (i) If jack misses many classes through illness, then he fails high school .
   - (ii) If jack fails high school, then he is uneducated.
   - (iii) If jack reads lot of books, then he is not uneducated.
   - (iv) Jack misses many classes through illness and reads lot of books.

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NEC

Subject Code: 19MCS1TH05
M.Tech - I Semester Regular & Supple Examinations, March-2023
COMPUTER NETWORKS
(CSE)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

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1. (a) Explain how are OSI and ISO related to each other?   [6M]
(b) Discuss about Internet standards.   [6M]

2. (a) Explain the different topologies of the network.   [6M]
(b) Illustrate some of the factors that determine whether a communication system is a LAN or WAN?   [6M]

3. (a) List the responsibilities of the data link layer in the Internet model? [6M]
(b) Explain error detection and error correction techniques?   [6M]

4. (a) Discuss about the difference between Simplex Protocol, Simplex Stop and Wait Protocol?
                                                                             [6M]
(b) Explain about HDLC?   [6M]

5. (a) Define BGP Protocol. Describe its routing functionality in detail?   [6M]
(b) Describe the Routing Information protocol and Distance vector routing protocol? [6M]

6. (a) Explain IP addressing method   [6M]
(b) Describe two groups of multicast routing protocols?   [6M]

7. (a) Explain leaky bucket and token bucket algorithm?   [6M]
(b) Explain UDP &TCP in detail?   [6M]

8. (a) Describe the role of the local name server and the authoritative name server in DNS [6M]
(b) Explain in detail about the working principles of Simple Network Management Protocol
(SNMP)   [6M]

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Subject Code: 19MCS1TH06

M.Tech - I Semester Regular & Supple Examinations, March-2024
ADVANCED SOFTWARE ENGINEERING
(CSE)

Time: 3 hours   Max Marks: 60

Answer any FIVE questions.
All questions carry EQUAL marks

1. (a) Explain Software Engineering Methodologies and Challenges? [6M]
   (b) Explain various software development life cycle phases?   [6M]

2. (a)What are different types of Requirements? Explain requirements analysis? [6M]
   (b) Explain requirements validation and management? [6M]

3. (a) What is software design? Explain various design principles? [6M]
   (b) Explain Modular and Structured Designs? [6M]

4. (a) Define software coding? Explain coding principles and code verification? [6M]
   (b) Explain Briefly Black box and white box Testing? [6M]

5. (a) Explain Utility and Regression Testing? [6M]
   (b) What id debugging? Explain various debugging Approaches? [6M]

6. (a) What is software project management? Explain software metrics and measurements? [6M]
   (b) Explain Various Software effort estimation Techniques? [6M]

7. What are software quality Factors? Explain Capability maturity model (CMM) in details [12M]

8. (a) What is software maintenance? Explain Maintenance cost issues? [6M]
   (b) Explain Software re-engineering and re-use? [6M]

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