

Time: 3 Hours**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	a) What are the major limitations of RP techniques?	05	01	02
	b) Explain the importance of the Rapid Prototyping Process Chain in product development.	05	01	02
(OR)				
2.	Discuss the fundamentals of Rapid Prototyping and its role in modern manufacturing.	10	01	03
<u>UNIT-II</u>				
3.	Explain the complete process of Solid Ground Curing (SGC) with suitable diagrams.	10	02	02
(OR)				
4.	a) What is Stereolithography Apparatus (SLA)? List any two of its models/specifications.	05	02	02
	b) Define photopolymerization and its role in SLA.	05	02	02
<u>UNIT-III</u>				
5.	a) What are the specifications of Laminated Object Manufacturing (LOM)?	05	03	02
	b) Mention any two advantages and two disadvantages of FDM.	05	03	02
(OR)				
6.	Compare LOM and FDM in terms of process, applications, and limitations.	10	03	03
<u>UNIT-IV</u>				
7.	Explain the complete process of 3D Printing (3DP) with neat diagrams.	10	04	02
(OR)				
8.	a) State the working principle of SLS.	05	04	02
	b) Differentiate between SLS and 3DP in terms of process.	05	04	03
<u>UNIT-V</u>				
9.	a) Differentiate between valid and invalid tessellated models.	05	05	03
	b) Write short notes on the features of RP software.	05	05	02
(OR)				
10.	a) Based on the STL format, how many triangles and coordinates would a cube contain?	05	05	02
	b) Explain overlapping facets?	05	05	02
<u>UNIT-VI</u>				
11.	a) List the type of industries that RP can be used in. List specific industrial applications?	05	06	02
	b) Explain any two applications of RP in engineering design.	05	06	02
(OR)				
12.	a) What are the typical RP applications in engineering and analysis? Briefly describe two of them and illustrate them with examples?	05	06	02
	b) How does RP support the application–material relationship?	05	06	02

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		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	a) Describe the reasons of automation in manufacturing.	5M	1	L2
	b) Explain various layouts used in automated plants with neat sketches	5M	1	L2
(OR)				
2.	a) Explain the various strategies used in automation.	5M	1	L2
	b) What are the applications of automation process in manufacturing?	5M	1	L2
<u>UNIT-II</u>				
3.	a) Discuss the various control functions of an automated transfer line.	5M	2	L2
	b) Explain the terminology used in transfer line analysis.	5M	2	L2
(OR)				
4.	a) Describe the work part Transport in automated production line.	5M	2	L2
	b) What are the design and fabrication considerations in an automated flow lines.	5M	2	L2
<u>UNIT-III</u>				
5.	a) What is the difference between manual assembly and automated assembly?	5M	3	L2
	b) What is the manufacturing process of assembling?	5M	3	L2
(OR)				
6.	a) Discuss briefly about the following line balancing terms: i) Precedence diagram ii) Manual Rational Work Element.	5M	3	L2
	b) Write a short note on assembly line techniques?	5M	3	L2
<u>UNIT-IV</u>				
7.	a) What are the different considerations in material handling system design?	5M	4	L2
	b) Explain the types of Bar code technology in automated storage systems.	5M	4	L2
(OR)				
8.	a) What are the different types of material handling systems and explain them with applications?	5M	4	L2
	b) Explain types of Automated Guided Vehicles with neat sketches.	5M	4	L2
<u>UNIT-V</u>				
9.	a) What is the role of a carousel in storage systems?	5M	5	L2
	b) Briefly Explain about tracking system and its advantages.	5M	5	L2
(OR)				
10.	a) Discuss any five Applications of AS/RS systems.	5M	5	L2
	b) Explain about 2D barcode systems.	5M	5	L2
<u>UNIT-VI</u>				
11.	a) What are the two basic components of a coordinate measuring machine?	5M	6	L2
	b) Briefly describe about Lean concepts in Manufacturing industry.	5M	6	L2
(OR)				
12.	a) Classify types of inspection methods and explain briefly.	5M	6	L2
	b) The operation of a machine vision system can be divided into three functions. Name and briefly describe them.	5M	6	L2

**Mobile Computing
(INFORMATION TECHNOLOGY)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	Explain the simplified reference model for mobile computing. What are its main components, and how do they interact?	10	CO1	L1
(OR)				
2.	Discuss novel applications of mobile computing and the limitations faced by mobile computing systems. How do these limitations impact service delivery?	10	CO1	L1
<u>UNIT-II</u>				
3. a)	Discuss the significance of localization and calling in GSM networks	5	CO2	L2
b)	Explain the protocols used in GSM with examples	5	CO2	L2
(OR)				
4.	Draw a detailed block diagram of GSM architecture. Explain the functions of each subsystem and the interfaces connecting them.	10	CO2	L3
<u>UNIT-III</u>				
5.	Explain the principles and working of classical FDMA, TDMA, and SDMA techniques used in MAC protocols.	10	CO3	L2
(OR)				
6.	Explain the architecture and key features of IEEE 802.11 Wireless LAN standard.	10	CO3	L2
<u>UNIT-IV</u>				
7.	Describe the process of IP packet delivery and handover management in Mobile IP. How does Mobile IP handle the movement of a mobile node between networks?	10	CO4	L3
(OR)				
8.	Discuss the roles of tunneling and encapsulation in Mobile IP packet forwarding. Briefly describe the working of DHCP in dynamic host configuration in mobile networks.	10	CO4	L2
<u>UNIT-V</u>				
9.	Explain the concepts of fast retransmit/fast recovery and transmission/time-out freezing in TCP. How do these mechanisms enhance TCP performance, especially in mobile networks?	10	CO5	L4
(OR)				
10.	Discuss selective retransmission and transaction-oriented TCP. Illustrate how these strategies improve reliability and efficiency in mobile transport layers.	10	CO5	L4
<u>UNIT-VI</u>				
11.	Explain the main challenges faced in routing and security within Mobile Ad hoc Networks (MANETs). Illustrate your answer with examples from commonly used routing protocols like DSR, DSDV, and AODV.	10	CO6	L2
(OR)				
12.	Explain the following four mobile platforms: J2ME, Symbian OS, Android, and Windows CE. Discuss their key features and applications.	10	CO6	L2

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		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	a) Explain the principle of conversion of solar energy in to heat.	5	1	2
	b) Briefly explain Terrestrial Solar Radiation with relevant diagrams.	5	1	2
(OR)				
2.	a) Explain about the Beam and Diffuse radiation.	5	1	2
	b) Describe the function of any two instruments used for measuring solar radiation.	5	1	2
<u>UNIT-II</u>				
3.	a) List different types of concentrating types collectors and explain any three of them.	5	2	3
	b) Explain applications of solar energy related to water heating and cooking.	5	2	2
(OR)				
4.	a) Describe solar Distillation with a sketch	5	2	3
	b) Briefly discuss any two ways of solar energy storage methods.	5	2	2
<u>UNIT-III</u>				
5.	a) Explain the basic principle of wind energy conversion?	5	3	2
	b) Distinguish between horizontal axis and vertical axis wind turbines	5	3	2
(OR)				
6.	a) Discuss the components of wind energy conversion systems	5	3	2
	b) List the advantages and disadvantages of wind energy.	5	3	2
<u>UNIT-IV</u>				
7.	a) Describe the biomass conversion techniques.	5	4	2
	b) List the advantages and disadvantages of biomass energy.	5	4	2
(OR)2				
8.	a) Explain about Chinese digester plant with the help of neat sketch.	5	4	3
	b) Explain photosynthesis. What are the conditions necessary for it?	5	4	2
<u>UNIT-V</u>				
9.	Explain the basic principle of working open type Ocean thermal energy conversion (OTEC) with a neat diagram.	10	5	3
(OR)				
10.	a) Explain the Dolphin type wave power machine.	5	5	3
	b) List the advantages and disadvantages of tidal energy.	5	5	2
<u>UNIT-VI</u>				
11.	a) Describe open cycle MHD system with a layout	7	6	3
	b) Write short notes on Peltier effect and Joule-Thomson Effect	3	6	2
(OR)				
12.	a) Write short note on: i) Seebeck effect ii) Joule effect	5	6	2
	b) Derive an expression for figure of merit of Thermoelectric generator	5	6	3

AR20

CODE: 20ECE453

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

IV B.Tech I Semester Regular & Supplementary Examinations, November - 2025

MACHINE LEARNING ALGORITHMS

(Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		<u>UNIT-I</u>	Marks	CO	BTL
1.	a)	Explain types of Machine Learning with suitable examples.	6	1	2
	b)	Describe the steps involved in building a machine learning model.	4	1	2
OR					
2.	a)	Define Mean, Median, Mode, Variance and Standard Deviation with formulae	6	1	2
	b)	For the dataset 12, 15, 14, 17, 12, 20, 18, 12, 16 – calculate Mean, Median and Mode.	4	1	3
UNIT-II					
3.	a)	Explain Naïve Bayes algorithm and its assumptions	4	2	2
	b)	What is Entropy and Information Gain? Explain their role in Decision Trees	6	2	2
OR					
4.	a)	Explain K-Nearest Neighbour algorithm with a simple example	6	2	2
	b)	List and explain any four performance evaluation metrics for classifiers	4	2	2
UNIT-III					
5.	a)	Describe K-means clustering and its working steps and evaluation metrics	5	3	2
	b)	Cluster the data points {3, 6, 2, 8, 12, 14, 5, 18} into two clusters using initial centroids m1=3 and m2=12. Use Euclidean distance.	5	3	3
OR					
6.		Explain DBSCAN clustering algorithm. How is it different from K-means?	10	3	2
UNIT-IV					
7.	a)	What is Dimensionality Reduction? Explain PCA step by step.	6	4	2
	b)	Explain Support Vector Machine for linearly separable data with a diagram	4	4	2
OR					
8.		Explain Support Vector Machine for linearly separable data with a diagram.	10	4	2
UNIT-V					
9.	a)	Discuss Linear Regression and Logistic Regression.	6	5	2
	b)	Explain the importance of Regularization in regression models.	4	5	2
OR					
10.		Explain the following: (i) L1-Regularization (ii) L2-Regularization (iii) Polynomial Regression	10	5	2
UNIT-VI					
11.	a)	Explain the architecture of a simple Artificial Neural Network.	4	6	2
	b)	Explain Perceptron, Activation Function and Hidden Layer.	6	6	2
OR					
12.		Explain the Back Propagation algorithm for training neural networks.	10	6	2

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	a) Explain the nature of radar and its basic principle of operation.	5M	1	2
	b) Draw and explain the block diagram of a basic radar system.	5M	1	2
(OR)				
2.	a) List out the frequency bands used for RADAR applications	5M	1	3
	b) Derive modified radar range equation and explain the prediction of range performance.	5M	1	3
<u>UNIT-II</u>				
3.	a) Derive the radar range equation and explain its practical significance.	5M	2	3
	b) Compare different receiver noise models used in radar.	5M	2	3
(OR)				
4.	a) Write a note on transmitter power requirements in radar systems.	5M	2	3
	b) Explain the concept of radar cross section (RCS) for a sphere target.	5M	2	2
<u>UNIT-III</u>				
5.	a) Explain the Doppler Effect and its role in CW radar.	5M	3	2
	b) Compare single frequency CW radar and multiple frequency CW radar.	5M	3	3
(OR)				
6.	a) What are the common measurement errors in FMCW radar?	5M	3	2
	b) Discuss the need for isolation between transmitter and receiver in CW radar.	5M	3	3
<u>UNIT-IV</u>				
7.	a) Explain the principle of MTI radar.	5M	4	2
	b) Define blind speeds in MTI radar and explain how to overcome them.	5M	4	2
(OR)				
8.	a) Compare MTI radar and Pulse Doppler radar.	5M	4	3
	b) Discuss the working of MTI radar with a power amplifier transmitter.	5M	4	3
<u>UNIT-V</u>				
9.	a) Describe the method of sequential lobing in radar tracking.	5M	5	3
	b) Discuss the operation of monopulse tracking radar.	5M	5	3
(OR)				
10.	a) Explain the principle of conical scan tracking radar.	5M	5	2
	b) Compare different types of radar trackers.	5M	5	3
<u>UNIT-VI</u>				
11.	a) Describe the principle and working of a matched filter receiver.	5M	6	3
	b) Compare the efficiency of non-matched filters vs matched filters.	5M	6	3
(OR)				
12.	a) Explain the role of circulators as duplexers in radar systems.	5M	6	2
	b) Derive the expression for matched filter characteristics.	5M	6	3

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	<u>UNIT-I</u>	Marks	CO	Blooms Level
1. a)	Write the principle operation of Cellular mobile system.	5M	CO1	Understanding
b)	With a neat sketch Explain the concept of Frequency Reuse.	5M	CO1	Applying
	(OR)			
2. a)	Explain about Cellular concept and system design fundamentals.	5M	CO1	Understanding
b)	Explain about cell splitting and cell sectoring.	5M	CO1	Understanding
	<u>UNIT-II</u>			
3. a)	Explain about three basic propagation mechanism in mobile radio propagation.	5M	CO2	Understanding
b)	Name and explain various Outdoor and Indoor propagation models.	5M	CO2	Understanding
	(OR)			
4. a)	Explain about Scattering in mobile communications with necessary diagrams.	5M	CO2	Understanding
b)	Describe the concept of fading in propagation	5M	CO2	Understanding
	<u>UNIT-III</u>			
5. a)	Discuss the need for Co Channel interference models.	5M	CO3	Understanding
b)	Explain the various types of non-cochannel interferences in a cellular environment?	5M	CO3	Understanding
	(OR)			
6. a)	Define Interference? Explain the types of Co-Channel interference models.	5M	CO3	Understanding
b)	Explain about diversity antenna types.	5M	CO3	Understanding
	<u>UNIT-IV</u>			
7. a)	What do you mean by handover and why handoff should be initiated when moving from one cell to another cell? Analyze what happens if handover is not done properly.	5M	CO4	Understanding
b)	Explain about the types of Hand offs in detail.	5M	CO4	Understanding
	(OR)			
8. a)	Explain the concept of Hand off mechanism.	5M	CO4	Understanding
b)	What are vehicle locating methods? Explain	5M	CO4	Understanding
	<u>UNIT-V</u>			
9. a)	What are the various channel assignment strategies with respect to cell sites? Explain in detail.	5M	CO5	Understanding
b)	Explain about Dynamic channel assignment strategies.	5M	CO5	Understanding
	(OR)			
10. a)	Explain about Fixed Channel assignment strategies.	5M	CO5	Understanding
b)	Explain about paging technique	5M	CO5	Understanding
	<u>UNIT-VI</u>			
11.	If GSM uses a frame structure where each frame consists of 8 time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find (a) the time duration of a bit, (b) the time duration of a slot, (c) the time duration of a frame, and (d) how long must a user occupying a single time slot must wait between two simultaneous transmissions.	10M	CO6	Applying
	(OR)			
12. a)	Compare FDMA, TDMA and CDMA.	5M	CO6	Understanding
b)	Explain in detail about SDMA.	5M	CO6	Understanding

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		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	a) Explain about the cellular Networks and Ad hoc Networks with a neat sketch.	5M	1	K5
	b) Demonstrate the Wireless Mesh Networks and Hybrid Wireless Networks with suitable examples.	5M	1	K2
(OR)				
2.	a) List and explain briefly the any five issues that affect the design, deployment, and performance of an ad hoc wireless system.	5M	1	K4
	b) Make use of a schematic diagram of the ad hoc wireless Internet to summarize the ad hoc wireless Internet.	5M	1	K3
<u>UNIT-II</u>				
3.	a) Explain the following: i. Bandwidth Efficiency ii. Quality of Service Support iii. Synchronization	5M	2	K2
	b) Summarize the important goals when a MAC protocol is designing for ad hoc networks.	5M	2	K2
(OR)				
4.	a) Justify the given sentence “hidden and exposed terminal problems significantly reduce the throughput of a network” with the help a neat diagram.	5M	2	K5
	b) Identify the reasons for making the separate protocols to control access the shared medium in wireless networks when compared to wired networks.	5M	2	K3
<u>UNIT-III</u>				
5.	a) Explain about Contention based protocol: Multiple Access Collision Avoidance protocol in wireless LANs.	5M	3	K2
	b) Demonstrate the Distributed Packet Reservation Multiple Access protocol with a frame structure.	5M	3	K2
(OR)				
6.	a) Interpret the distributed priority scheduling protocol.	5M	3	K2
	b) Distinguish the Contention based protocols and Contention based protocols with Reservation Mechanisms.	5M	3	K4
<u>UNIT-IV</u>				
7.	a) List out and explain briefly about the Characteristics of an Ideal Routing Protocol for Ad Hoc Wireless Networks.	5M	4	K4
	b) Explain about the Table-Driven Routing protocol: DSDV.	5M	4	K2
(OR)				
8.	a) Outline the On-Demand Routing protocol: DSR.	5M	4	K2
	b) Summarize the Hybrid Routing Protocol: CEDAR.	5M	4	K2
<u>UNIT-V</u>				
9.	a) Compare Sensor Networks with Ad-hoc Wireless Networks.	5M	5	K4
	b) Explain the Sensor Network Architecture: Clustered architecture.	5M	5	K5
(OR)				
10.	a) List the reasons which lead to the design challenges of sensor networks.	5M	5	K4
	b) Classify the sensor network protocols with a neat diagram.	5M	5	K4
<u>UNIT-VI</u>				
11.	a) Explain briefly about the Self-Organizing MAC for Sensor Networks (SMACS) and Eavesdrop and Register (EAR), Hybrid TDMA /FDMA.	5M	6	K2
	b) Summarize the Synchronization related issues in sensor networks.	5M	6	K2
(OR)				
12.	a) Demonstrate the indoor and sensor network localization.	5M	6	K2
	b) Contrast the SPEED and RAP protocols.	5M	6	K2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

IV B.Tech I Semester Regular & Supplementary Examinations, November-2025

PRESTRESSED CONCRETE

**Professional Elective– V
(Civil ENGINEERING)**

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	a) what is prestressed concrete, Mention the advantages and disadvantages of prestressed concrete in comparison with reinforced concrete	5M	01	2
	b) Discuss about different methods of prestressing	5M	01	2
(OR)				
2.	Discuss in detail about the devices required for pre-tensioning and post tensioning systems	10M	01	3
<u>UNIT-II</u>				
3.	a) Explain the loss of stress due to friction?	4M	02	2
	b) A pre-stressed concrete beam of span 10m is post-tensioned using a cable eccentricity 300 at center and zero at supports. the initial force in the cable is 400kN at the jacking end. determine the loss of pre-stress in the cable due to friction and effective force in the cable at the farther end. assume co-efficient of friction = 0.3 and co-efficient for wave effect is= 0.0043/m.	6M	02	3
(OR)				
4.	A Pre-stressed concrete pile is 300 mm x 300 mm in section is provided with 40 wires of 3 mm diameter distributed uniformly over length of 6m. The Initially the wires are tensioned in pre-stressing beds with a total pull of 450kN. Determine the final percentage loss of stress in the wires. Take $E_s=2.1 \times 10^5 \text{ N/mm}^2$, $E_c= 3.2 \times 10^4 \text{ N/mm}^2$. Creep coefficient = 1.6. Total shrinkage strain = 200×10^{-6} . Relaxation loss of stress in steel=4.5% of the initial stress.	10M	02	3
<u>UNIT-III</u>				
5.	a) Explain different types of flexural failures.	4M	03	2
	b) A pretensioned beam of rectangular section 230 mm wide and 400 mm deep, is stressed by 400 mm ² of high-tensile steel at an effective depth of 350 mm. Given $f_{ck} = 40 \text{ N/mm}^2$, $f_{pu} = 1600 \text{ N/mm}^2$, $f_y = 415 \text{ N/mm}^2$. Estimate the moment capacity of the section using IS code provisions.	6M	03	4
(OR)				
6.	A PSC beam of effective span 12m is of rectangular section 400mm wide and 800mm deep. A tendons consist of 2600mm ² of strands of characteristic strength 1600 N/mm ² with an effective prestress of 920 N/mm ² . The strands are located 700mm from the top face of the beam. If $f_{ck} = 60 \text{ N/mm}^2$, estimate the flexural strength of the section.	10M	03	3

UNIT-IV

7. post tensioned beam of 15m of rectangular cross section, 250 mm wide and 475 mm deep, is 10 m long and carries an applied load of 10kN/m.UDL on the beam. The effective prestressing force in the cable is 650 kN. The cable is Parabolic with zero eccentricity at the supports and a maximum eccentricity of 150 mm at the center of span. Calculate the principal stresses at the supports

(OR)

8. The support section of a prestressed concrete beam, 120 mm wide by 200 mm deep, is required to support an ultimate shear force of 100 kN. The compressive prestress at the centroidal axis is 8N/mm² . The characteristic cube strength of concrete is 50 N/mm² . The cover to the tension reinforcement is 30 mm. If the characteristic tensile strength of stirrups is 415 N/mm², design suitable shear reinforcements in the section using IS code recommendations.

UNIT-V

9. a) Explain mohr's theorem? 4M 05 2
b) A rectangular beam 230 × 400 mm in section is simply-supported over a span of 12m. It is prestressed with a parabolic cable which has a maximum eccentricity of 200 mm at midspan and 50 mm at support sections. Effective prestressing force is 1500 kN. Concrete grade is M40. Determine the deflection due to prestress and self weight. 6M 05 4

(OR)

10. The end block of a post tensioned concrete beam 400 mm×400 mm is subjected to a concentric anchorage force of 1000 kN by a freyssinet anchorage system of area 1000mm². Design, Discuss and detail the anchorage reinforcement for the end block. 10M 05 4

UNIT-VI

11. Discuss various methods of analysing statically indeterminate structures for secondary moments. 10M 06 3

(OR)

12. A continuous prestressed concrete beam ABC (AB=BC=10m) has a uniform rectangular cross section with a width of 120 mm and depth of 350 mm. The cable carrying an effective prestressing force of 500 kN is parallel to the axis of the beam and located at 120 mm from the soffit. Determine the secondary and resultant moment at the central support B and also locate the resultant line of thrust through beam AB. 10M 06 4

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<u>UNIT-I</u>		Marks	CO	BL
1.	a) Outline the differences between relational databases and NoSQL databases.	5	1	L1
	b) Define impedance mismatch and explain its challenges for application development.	5	1	L2
(OR)				
2.	a) Describe the concept of concurrency in databases.	5	1	L2
	b) Illustrate how persistent data is handled differently in relational and NoSQL systems.	5	1	L3
<u>UNIT-II</u>				
3.	a) Summarize aggregate-oriented data models with examples.	5	2	L1
	b) Explain the structure and advantages of column-family stores in NoSQL.	5	2	L2
(OR)				
4.	a) Describe schema-less databases and their major benefits.	5	2	L2
	b) Explain Modeling for Data Access in the context of NoSQL databases.	5	2	L2
<u>UNIT-III</u>				
5.	a) Describe different distribution models: single server vs. sharding	5	3	L1
	b) Explain update consistency and read consistency with examples.	5	3	L2
(OR)				
6.	a) Explain Master-Slave and Peer-to-Peer replication in NoSQL databases.	5	3	L1
	b) Discuss the CAP theorem and its significance in distributed database design.	5	3	L2
<u>UNIT-IV</u>				
7.	a) What is a key-value store? Give one example.	5	4	L1
	b) Explain features of key-value stores that enable scalability.	5	4	L2
(OR)				
8.	Discuss scenarios where key-value stores provide optimal performance.	10	4	L2
<u>UNIT-V</u>				
9.	a) What is a document database? Provide examples.	5	5	L1
	b) Illustrate how an e-commerce application can utilize a document database.	5	5	L3
(OR)				
10.	a) Explain when not to use Document databases	5	5	L2
	b) Explain event logging and its implementation in document-oriented databases.	5	5	L2
<u>UNIT-VI</u>				
11.	a) Discuss scenarios where graph databases may not be applicable.	5	6	L2
	b) Explain Transactions in graph database.	5	6	
(OR)				
12.	a) Explain sharding and its role in scaling applications.	5	6	L2
	b) Discuss availability in context of graph databases	5	6	L2

Time: 3 Hours**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<u>UNIT-I</u>				
1.	Explain in detail Analytic Processes and Tools available in Big Data Analytics?	10	CO1	K3
(OR)				
2. a)	Discuss the challenges of conventional systems and explain how Big Data provides advantages?	5	CO1	K3
b)	Differentiate between Analysis and Reporting with examples?	5	CO1	K2
<u>UNIT-II</u>				
3. a)	Explain the Stream Data Model and Architecture?	5	CO2	K2
b)	Write about Counting Distinct Elements in a stream?	5	CO2	K2
(OR)				
4. a)	Explain Real Time Analytics Platform (RTAP) applications and methods?	5	CO2	K2
b)	Describe Estimating Moments and its advantages?	5	CO2	K2
<u>UNIT-III</u>				
5. a)	Write about Hadoop Distributed File System (HDFS) and its working structure?	5	CO3	K3
b)	What is Hadoop Streaming in Big Data Analytics?	5	CO3	K2
(OR)				
6.	Explain Hadoop Components and their role in data analysis?	10	CO3	K2
<u>UNIT-IV</u>				
7.	Write about Anatomy of a MapReduce Job run with neat sketch?	10	CO4	K2
(OR)				
8. a)	Explain different MapReduce types and formats?	5	CO4	K2
b)	How do MapReduce features support Hadoop environment?	5	CO4	K3
<u>UNIT-V</u>				
9. a)	Explain the difference between PIG and HIVE?	5	CO5	K2
b)	What are the processing operators available in PIG?	5	CO5	K1
(OR)				
10. a)	Give an example of Querying Data in Hive? (5	CO5	K3
b)	Mention a few fundamentals of HBase and ZooKeeper?	5	CO5	K1
<u>UNIT-VI</u>				
11.	Explain visual data analysis techniques that support Big Data Analytics?	10	CO6	K2
(OR)				
12. a)	Explain Simple Linear Regression with an example?	5	CO6	K3
b)	Explain Multiple Linear Regression?	5	CO6	K2

**ELECTRIC DRIVES
(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Draw the block diagram and explain the operation of four quadrant control using dual converter in dc motor drive. 6M
b) Explain dynamic and Regenerative braking briefly. 6M
- (OR)**
2. a) What are the different types of braking in DC motors. Why plugging is not popular. 6M
b) Explain with one application of dual converter for speed control of DC motor. 6M

UNIT-II

3. a) Draw the armature voltage and armature current waveforms of 3 phase semiconverter-fed DC motor drive for $\alpha=60^\circ$. 6M
b) A 220 V, 1500 rpm, 50 A separately excited motor with armature resistance of 0.5Ω is fed from a three-phase fully controlled rectifier. Available ac source has a line voltage of 440 V, 50 Hz. A star-delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when the converter firing angle is zero. Determine the value of firing angle when: (a) motor is running at 1200 rpm and rated torque and (b) when motor is running at -800 rpm and twice the rated torque. 6M
- (OR)**
4. a) Explain the operation of a DC series motor fed from a single phase fully controlled converter with relevant waveforms. 6M
b) Derive the speed-torque (ω -T) equation of a separately excited DC motor. Plot the ω -T characteristics of the motor. 6M

UNIT-III

5. a) Explain the principle of operation of the chopper for the first quadrant operations with all relevant diagrams. 6M
b) Explain closed loop control of one-quadrant chopper controlled separately excited DC motor drive for a step-command in speed reference in normalized form. 6M
- (OR)**
6. a) Discuss regenerative braking control of DC separately excited motor using chopper. 6M
b) Describe four quadrant chopper controlled operation of DC motor drive with necessary diagram and wave forms. 6M

UNIT-IV

7. a) Discuss stator voltage control method for speed control of induction motor. 6M
b) Discuss principle of V/f control of induction motor in detail with necessary equation and diagram. 6M

(OR)

8. a) Discuss effect of variation in rotor resistance on induction motor performance. 6M
b) Develop the speed-torque characteristics of induction motor in four quadrants. 6M

UNIT-V

9. a) What is slip power recovery. How it can be used for speed control of induction motor. 6M
b) Explain about Static Scherbius drive with neat diagram. 6M

(OR)

10. a) When a synchronous motor is operating in true synchronous mode, frequency must be varied in steps. Why. 6M
b) Explain in detail about self-control mode of operation of synchronous motor. 6M

AR18

CODE: 18CEE431

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, November,2025
REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM
(Civil ENGINEERING)**

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. Explain about the interaction of EMR with (a) atmosphere (b) Earth's Surface 6M
6M

(OR)

2. a) What are the components of remote sensing explain with a neat diagram 6M
b) Define EMS with a neat sketch and mention all the types of rays with their wavelength and their application 6M

UNIT-II

3. a) Define Platform sensors and their types that are used in remote sensing 6M
b) Define Image data formats with suitable examples 6M

(OR)

4. a) Explain briefly about the sensors and classification that are used in remote sensing 6M
b) What is Image data and mention its importance with a neat sketch 6M

UNIT-III

5. a) What are the elements of visual interpretations explain with suitable examples 6M
b) Mention the types of Image processing used in remote sensing 6M

(OR)

6. a) Define image classification and its types in remote sensing 6M
b) Briefly Mention the different image enhancement techniques 6M

UNIT-IV

7. a) What do you mean by GIS? Explain hardware components of GIS 6M
b) Explain vector data model and mention advantages of vector data model. 6M

(OR)

8. a) Explain Map projection types based on their characteristics 6M
b) Mention advantages of raster data and limitation of vector data model. 6M

UNIT-V

9. a) How can spatial data analysis in the field of urban city and military? 6M
b) Compare arithmetic operators and logical operators from spatial data analysis 6M

(OR)

10. a) Define Land use and Land cover and how they can be used in remote sensing and GIS 6M
b) Briefly describe about the applications of GIS in geology and geomorphology 6M