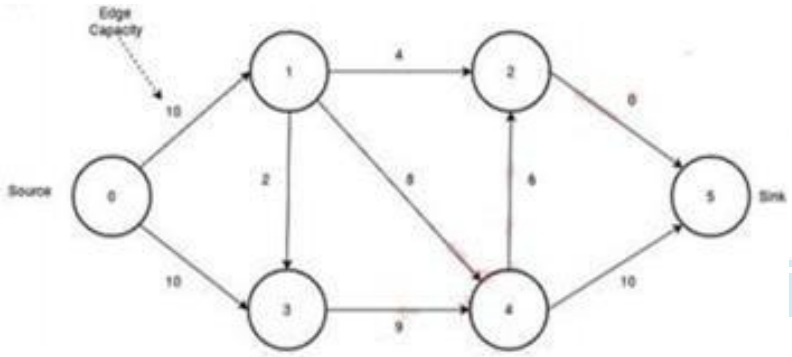
					Course Code: D2515901
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech I Semester MODEL QUESTION PAPER			
		ADVANCED ALGORITHMS ANALYSIS			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
			CO	KL	M
		UNIT-1			
1.	**a).**	Apply the Quick sort algorithm to the following data and comment on complexity 40, 10, 15, 20, 35, 45, 25, 15, 45, 10	1	3	6
	b).	Analyze the performance of a Binary search and linear search algorithms. Compute complexity of binary search and linear search	1	4	6
		OR			
2.	**a).**	Evaluate the maximum flow for the following graph 	1	4	6
	b).	Apply BFS Algorithm for the following values: Given graph with 5 nodes and 3 edges, [1,2], [1,3], [3,4]	1	4	6
		UNIT-2			
3.	**a).**	Apply the greedy algorithm to a weighted activity selection problem and explain step-by-step.	2	4	6
	b).	Classify the greedy method by taking a suitable example of active selection problem	2	3	6
		OR			
4.	**a).**	Classify the characterization of maximum matching by augmenting paths	2	3	6
	b).	Apply Dijkstra's algorithm for single-source shortest paths. How can it be used for solving all-pairs shortest paths problem?	2	4	6
		UNIT-3			
5.	**a).**	Analyze the maximum flow using Ford-Fulkerson Algorithm	3	4	6

	b).	Solve Edmond-Karp maximum-flow algorithm with an example	3	3	6
OR					
6.	**a).**	Apply the divide and conquer method to solve the maximum subarray problem	3	3	6
	b).	Analyze the max flow-mincut theorem with an example	3	4	6
UNIT-4					
7.	**a).**	Apply the Chinese remainder theorem to the following equations: a = 2 (mod 5) b = 3 (mod 13) Generate solutions in the form of a table	4	3	6
	b).	Distinguish polynomial multiplication and division	4	4	6
OR					
8.	**a).**	Identify Conversions between base-representation and modulo-representation	4	3	6
	b).	Evaluate the Fast Fourier Transform algorithm with an example	4	5	6
UNIT-5					
9.	**a).**	Prove that the clique problem is NP-complete	5	4	6
	b).	Prove the Travelling Salesman Problem as NP complete	5	4	6
OR					
10.	**a).**	Prove that the feedback edge set problem is NP-complete	5	4	6
	b).	Compare polynomial multiplication and division	5	4	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

		Course Code: D2515902			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech I Semester MODEL QUESTION PAPER			
		ADVANCED DATA WAREHOUSING AND DATA MINING			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
					5 x 10 =50Marks
		UNIT-1	**CO**	**KL**	**M**
1.	**a).**	Compare OLAP and OLTP systems	**1**	**2**	**6**
	b).	Illustrate the multitier data warehouse architecture	**1**	**2**	**6**
		OR			
2.	**a).**	A data warehouse can be modeled by either a star schema or a snowflake schema. Briefly describe the similarities and the differences of the two models, and then analyze their advantages and disadvantages with regard to one another. Give your opinion of which might be more empirically useful and state the reasons behind your answer.	**1**	**3**	**6**
	b).	What are the critical challenges and limitations encountered in data mining, and how can they be effectively addressed through emerging technologies and methodologies?	**1**	**3**	**6**
		UNIT-2			
3.	**a).**	Classify the types of attributes that are used to describe data objects	**2**	**3**	**6**
	b).	Discuss about estimating data dissimilarity measures on numeric data? Given two objects represented by the tuples(22,1,42,10) and (20,0,36,8). a) Compute Euclidean distance between the objects. b) Compute Manhattan distance between objects. c) Compute Supremum distance between the objects.	**2**	**3**	**6**
		OR			
4.	**a).**	In real-world data, tuples with missing values for some attributes are a common occurrence. Describe various methods for handling this problem	**2**	**3**	**6**
	b).	Explain about data transformation strategies? Use these methods to normalize the following group of data: 200,300,400,600,1000 a) min-max normalization by setting min = 0 and max = 1 b) z-score normalization. c) z-score normalization using the mean absolute deviation instead of standard deviation	**2**	**3**	**6**

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>UNIT-3</td><td></td><td></td><td></td></tr>
<tr><td>5.</td><td>a).</td><td>Apply decision tree algorithm on the following dataset
<table><tr><th>Day</th><th>Outlook</th><th>Temperature</th><th>Humidity</th><th>Wind</th><th>Response Class
Play=Yes
Play=No</th></tr><tr><td>Day1</td><td>Sunny</td><td>Hot</td><td>High</td><td>Weak</td><td>No</td></tr><tr><td>Day2</td><td>Sunny</td><td>Hot</td><td>High</td><td>Strong</td><td>No</td></tr><tr><td>Day3</td><td>Overcast</td><td>Hot</td><td>High</td><td>Weak</td><td>Yes</td></tr><tr><td>Day4</td><td>Rain</td><td>Mild</td><td>High</td><td>Weak</td><td>Yes</td></tr><tr><td>Day5</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>Day6</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Strong</td><td>No</td></tr><tr><td>Day7</td><td>Overcast</td><td>Cool</td><td>Normal</td><td>Strong</td><td>Yes</td></tr><tr><td>Day8</td><td>Sunny</td><td>Mild</td><td>High</td><td>Weak</td><td>No</td></tr><tr><td>Day9</td><td>Sunny</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>Day10</td><td>Rain</td><td>Mild</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>Day11</td><td>Sunny</td><td>Mild</td><td>Normal</td><td>Strong</td><td>Yes</td></tr><tr><td>Day12</td><td>Overcast</td><td>Mild</td><td>High</td><td>Strong</td><td>Yes</td></tr><tr><td>Day13</td><td>Overcast</td><td>Hot</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>Day14</td><td>Rain</td><td>Mild</td><td>High</td><td>Strong</td><td>No</td></tr></table></td><td>3</td><td>3</td><td>6</td></tr>
<tr><td></td><td>b).</td><td>Demonstrate the different attribute selection measures</td><td>3</td><td>3</td><td>6</td></tr>
<tr><td></td><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>6.</td><td>a).</td><td>Apply Naïve Bayes on the following binary classification problem
<table><tr><th>Color</th><th>Type</th><th>Origin</th><th>Stolen ?</th></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>Yes</td></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>No</td></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>Yes</td></tr><tr><td>Yellow</td><td>Sports</td><td>Domestic</td><td>No</td></tr><tr><td>Yellow</td><td>Sports</td><td>Imported</td><td>Yes</td></tr><tr><td>Yellow</td><td>SUV</td><td>Imported</td><td>No</td></tr><tr><td>Yellow</td><td>SUV</td><td>Imported</td><td>Yes</td></tr><tr><td>Yellow</td><td>SUV</td><td>Domestic</td><td>No</td></tr><tr><td>Red</td><td>SUV</td><td>Imported</td><td>No</td></tr><tr><td>Red</td><td>Sports</td><td>Imported</td><td>Yes</td></tr></table>Classify whether the following automobile is stolen or not?
(Color=”Red”, Type=”SUV”, Origin=”Domestic”, Stolen=?)</td><td>3</td><td>3</td><td>6</td></tr>
<tr><td></td><td>b).</td><td>Discuss the different methods used for evaluating the performance of a classifier</td><td>3</td><td>3</td><td>6</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>UNIT-4</td><td></td><td></td><td></td></tr>
<tr><td>7.</td><td>a).</td><td>Consider the following transactions. Consider min_sup=60% and min_conf=80%. Find all frequent itemsets using Apriori algorithm.
<table><tr><td>TID</td><td>Items Bought</td></tr><tr><td>T100</td><td>{I1,I2,I3,I4,I5,I6}</td></tr><tr><td>T200</td><td>{I8,I3,I4,I5,I6}</td></tr></table></td><td>4</td><td>3</td><td>6</td></tr>
</table>

			T300	{I1,I7,I4,I5}			
			T400	{I1,I7,I8,I4,I6}			
			T500	{I8,I2,I2,I4,I5,I6}			
	b).	Discuss about pattern mining in multidimensional and multilevel association?			**4**	**3**	**6**
		OR					
8.	**a).**	Analyze the significance of association analysis in the context of market basket analysis.			**4**	**3**	**6**
	b).	Demonstrate FP Growth algorithm with an example.			**4**	**3**	**6**
		UNIT-5					
9.	**a).**	Discuss the different types of data involved in cluster analysis.			**5**	**3**	**6**
	b).	Consider that the data mining task is to cluster the following seven points P1, P2, P3, P4, P5, P6, P7 into two clusters. P1 (1,1), P2 (2,2), P3 (3,4), P4 (5,7), P5 (3,5), P6 (4,5) and P7(4,6). The distance function is Euclidean distance. Apply K-means algorithm with two iterations to form two clusters by taking the initial cluster centers as points P1 and P4			**5**	**3**	**6**
		OR					
10.	**a).**	Compare the strengths and weaknesses of K-Means, Agglomerative Hierarchical Clustering and DBSCAN			**5**	**2**	**6**
	b).	Demonstrate DBSCAN algorithm with an example			**5**	**3**	**6**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

		Course Code: D2515903			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech. I Semester MODEL QUESTION PAPER			
		ARTIFICIAL INTELLIGENCE			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
		UNIT-1			
1.	**a).**	Explain the foundations of Artificial Intelligence and discuss how they influence modern AI systems.	1	2	6
	b).	Explain the principles of Constraint Satisfaction Problems (CSP) to solve the equation BASE+BALL=GAMES. Demonstrate the steps involved in finding the solution	1	2	6
		OR			
2.	**a).**	Explain the tic-tac-toe game playing approaches in AI, including representation and decision-making	1	2	6
	b).	Explain exhaustive search techniques with heuristic search methods, highlighting their advantages and limitations	1	2	6
		UNIT-2			
3.	**a).**	Use the following theorem using deductive inference rules From A → B ∧ C, A infer C, from A ∧ B, A → C infer C.	2	3	6
	b).	Apply the mini max algorithm with an example.	2	3	6
		OR			
4.	**a).**	Consider the following problem. • John likes all kinds of food. • Apples are food. • Chicken is food. • Anything any one eats and isn't killed by is food. • Bill ate peanuts and still alive. • Sue eats everything Bill eats. i) Convert the formulas into clause form. ii) Prove that "John likes peanuts" using resolution	2	3	12
		UNIT-3			
5.	**a).**	Use a frame based system for university application.	3	3	6
	b).	Represent the following facts in Conceptual Dependency: a. John gave the AI book to marry.	3	3	6

		b. John punched marry.			
		OR			
6.	**a).**	Demonstrate a step by step script for writing exam in an examination hall.	3	3	6
	b).	Represent the following facts using Partitioned Semantic Nets: a. The dog bite the mail carrier b. Every batter hit every bowler	3	3	6
		UNIT-4			
7.	**a).**	Apply Dempster Shafer theory for the given example In diagnosis problem might consist of set { allergy,Flu, Cold, Pneu}: M1 is { allergy , Flu, Cold, Pneu}=0.6 {Θ } = 0.4 M2 is { allergy ,Flu ,Cold}=0.8 { Θ} = 0.2,,Compute M3 belief Function	4	3	12
		OR			
8.	**a).**	Explain Bayesian belief networks by taking suitable example.	4	2	6
	b).	Explain Truth maintenance system in detail.	4	2	6
		UNIT-5			
9.	**a).**	Explain the architecture of Expert system.	5	2	6
	b).	Explain model based reasoning and case based reasoning.	5	2	6
		OR			
10.	**a).**	Explain different types of expert systems with suitable examples.	5	3	12

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

				COURSE CODE : D25159A0	
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech. I Semester MODEL QUESTION PAPER			
		IMAGE PROCESSING			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
		UNIT-1	CO	KL	M
1.	**a).**	Explain the fundamental steps in Image Processing System	**1**	**2**	**6**
	b).	DifferentiateImage sampling & Quantization	**1**	**2**	**6**
		OR			
2.	**a).**	Explain the components of an image processing system with a neat diagram.	**1**	**2**	**6**
	b).	Explain in detail the spatial domain enhancement techniques: a. Basic gray-level transformations b. Histogram equalization	**1**	**2**	**6**
		UNIT-2			
3.	**a).**	Explain in detail the concept of spatial filtering. Discuss different types of smoothing and sharpening filters with examples.	**2**	**2**	**6**
	b).	Explain two commonly used color models in digital image processing.	**2**	**2**	**6**
		OR			
4.	**a).**	Explain the Model of Image restoration process	**2**	**2**	**6**
	b).	Explain the following image restoration techniques with equations and applications: a. Inverse filtering b. Minimum Mean Square Error (MMSE) filtering	**2**	**2**	**6**
		UNIT-3			
5.	**a).**	Apply the concept of redundancy reduction to explain how interpixel and psycho visual redundancies are exploited in image compression. Give suitable examples.	**3**	**3**	**6**
	b).	Differentiate between lossless and lossy compression techniques. Analyze which method is more suitable for medical imaging and justify your answer.	**3**	**3**	**6**
		OR			
6.	**a).**	Illustrate the process of Run Length coding	**3**	**2**	**6**
	b).	Analyze the differences between JPEG, JPEG2000, and MPEG	**3**	**3**	**6**

		standards in terms of compression technique, performance, and applications.			
		UNIT-4			
7.	**a).**	Apply the concept of multi-resolution analysis (MRA) to show how an image can be represented at different scales. Illustrate with a block diagram.	**4**	**3**	**6**
	b).	Demonstrate how an image can be expressed using a wavelet series expansion.	**4**	**3**	**6**
		OR			
8.	**a).**	Using the MRA refinement equation , analyze how scaling functions are used in wavelet-based image compression. Give an example of a simple scaling function.	**4**	**3**	**6**
	b).	Differentiate between Discrete Wavelet Transform (DWT) and Continuous Wavelet Transform (CWT).	**4**	**2**	**6**
		UNIT-5			
9.	**a).**	Explain the watershed segmentation technique.	**5**	**2**	**6**
	b).	Using an example, analyze how thresholding techniques are applied in image segmentation	**5**	**3**	**6**
		OR			
10.	**a).**	Apply the concept of feature extraction and classification in image analysis	**5**	**3**	**6**
	b).	Explain the need and applications of digital image watermarking in copyright protection. Compare watermarking methods in terms of robustness and image quality analysis.	**5**	**2**	**6**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

Course Code: D25159A1

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) **R25**

I M.Tech. I Semester MODEL QUESTION PAPER

SOFT COMPUTING

Computer Science & Technology

Time: 3 Hrs. **Max. Marks: 60 M**

Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
		UNIT-1			
1.	**a).**	Explain the difference between biological neurons and artificial neurons with suitable examples.	**1**	**2**	**6**
	b).	Describe the role of activation functions in artificial neural networks. Why are they necessary?	**1**	**2**	**6**
		OR			
2.	**a).**	Explain the basic structure and working principle of the McCulloch-Pitts Neuron model.	**1**	**2**	**6**
	b).	Compare different basic models of artificial neural networks in terms of their structure and learning ability.	**1**	**2**	**6**
		UNIT-2			
3.	**a).**	Apply the Perceptron learning rule to classify the logical AND function. Show the step-by-step weight updates.	**2**	**3**	**6**
	b).	Construct the training and testing procedure for a perceptron model with a given dataset. **X1** **X2** **Yd** 0 0 0 0 1 1 1 0 1 1 1 1	**2**	**3**	**6**
		OR			
4.	**a).**	Construct a training procedure using backpropagation to solve the XOR problem, showing how hidden neurons are essential.	**2**	**3**	**12**
		UNIT-3			
5.	**a).**	Describe the basic properties of fuzzy sets.	**3**	**2**	**6**
	b).	Illustrate with an example how operations on fuzzy relations are performed.	**3**	**2**	**6**
		OR			
6.	**a).**	List and describe different methods of membership value assignments.	**3**	**2**	**6**
	b).	Explain the process of fuzzification with a suitable example.	**3**	**2**	**6**

		UNIT-4			
7.	**a).**	Explain the concept of decomposition of fuzzy rules with an example.	**4**	**2**	**6**
	b).	Describe the structure and working of a Fuzzy Inference System (FIS).	**4**	**2**	**6**
		OR			
8.	**a).**	Describe the concept of a neuro-fuzzy hybrid system.	**4**	**2**	**6**
	b).	Explain the differences between Mamdani and Sugeno fuzzy inference systems.	**4**	**2**	**6**
		UNIT-5			
9.	**a).**	Apply the genetic algorithm flow to find the maximum of a simple function $f(x)=x^2$ for $x \in [0,31]$ using binary encoding. Show selection, crossover, and mutation steps.	**5**	**3**	**12**
		OR			
10.	**a).**	Construct a small example of a genetic-neuro hybrid system, showing how GA can optimize neural network weights.	**5**	**3**	**6**
	b).	Given a population of chromosomes, perform one generation of roulette wheel selection and show which chromosomes are chosen for reproduction. **Chromosome** | **Fitness** C1 | 10 C2 | 30 C3 | 20 C4 | 25 C5 | 15	**5**	**3**	**6**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

				Course Code: D25159A2	
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. I Semester MODEL QUESTION PAPER					
ADVANCED COMPUTER NETWORKS					
Computer Science & Technology					
Time: 3 Hrs.				**Max. Marks: 60 M**	
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
		UNIT-1	**CO**	**KL**	**M**
1.	**a).**	Explain the concept of store-and-forward packet switching with a neat diagram.	**1**	**2**	**6**
	b).	Compare virtual-circuit and datagram subnets with suitable examples.	**1**	**2**	**6**
		OR			
2.	**a).**	Describe hierarchical routing and explain why it is needed in large networks.	**1**	**2**	**6**
	b).	Differentiate between load shedding and random early detection (RED) in congestion control.	**1**	**2**	**6**
		UNIT-2			
3.	**a).**	An organization has been assigned the IP block 200.100.50.0/26. (a) Divide this block into 4 equal subnets. (b) For each subnet, write: 1. Subnet Mask 2. Network Address 3. First Host Address 4. Last Host Address 5. Broadcast Address	**2**	**3**	**12**
		OR			
4.	**a).**	A private network uses the IP range 10.0.0.0/24, and a NAT router has the public IP 203.0.113.5. If three internal hosts (10.0.0.2, 10.0.0.5, 10.0.0.10 access the internet simultaneously, show how NAT translates their private addresses into the public IP using port numbers.	**2**	**3**	**6**
	b).	Consider the following network prefixes: • 192.168.0.0/24 • 192.168.1.0/24 • 192.168.2.0/24 Use CIDR aggregation to combine them into a single prefix.	**2**	**3**	**6**
		UNIT-3			
5.	**a).**	Describe TCP's error control mechanism.	**3**	**2**	**6**

	b).	A TCP connection is established between Host A and Host B. The initial sequence number of A is 1000, and B is 5000.Show the three-way handshake sequence numbers and acknowledgment numbers.Explain how TCP ensures reliable connection establishment.	**3**	**3**	**6**
		OR			
6.	**a).**	Compare TCP and SCTP in terms of connection establishment, flow control, and reliability.	**3**	**2**	**6**
	b).	A TCP sender uses a sliding window of size 4 segments. The sender transmits segments 1, 2, 3, 4, and 5, but segment 2 is lost.Show how TCP handles retransmission and sliding window adjustment.Drawa timeline of sequence numbers and acknowledgments.	**3**	**3**	**6**
		UNIT-4			
7.	**a).**	Describe the access control mechanisms used in Wireless LANs.	**4**	**2**	**6**
	b).	Differentiate between 1G, 2G, 3G, and 4G networks.	**4**	**2**	**6**
		OR			
8.	**a).**	Explain the architecture of Bluetooth.	**4**	**2**	**6**
	b).	Compare MEO and LEO satellites.	**4**	**2**	**6**
		UNIT-5			
9.	**a).**	Describe the mobility issues that arise in mobile computing.	**5**	**2**	**6**
	b).	List and explain the applications of Ad Hoc Networks.	**5**	**2**	**6**
		OR			
10.	**a).**	Explain the functioning of Wireless Sensor Networks (WSNs).	**5**	**2**	**6**
	b).	Describe the characteristics of Peer-to-Peer (P2P) networks.	**5**	**2**	**6**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25159A3
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. I Semester Model Question Paper					
ADVANCED SOFTWARE ENGINEERING					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	**a).**	Briefly explain the perspective process models.	1	2	6
	b).	Describe the steps involved in the Scrum framework	1	2	6
OR					
2.	**a).**	Why is agility important in modern software engineering?	1	2	6
	b).	How do process models support software engineering practice?	1	2	6
UNIT-II					
3.	**a).**	Explain the core principles that guide good software engineering practice. How do these principles apply at different stages of a generic framework activity? Give suitable illustrations	2	3	6
	b).	Illustrate how use cases contribute to the development of an analysis model in requirements engineering with relevant examples.	2	3	6
OR					
4.	**a).**	Compare and contrast class-based modeling, functional modeling, and behavioral modeling in requirements analysis. Analyze the situations in which each type of modeling is most appropriate.	2	3	12
UNIT-III					
5.	**a).**	Discuss how mobile development life cycle, mobile architecture, and the web design pyramid affect the quality of mobility-oriented design. Use practical scenarios to justify your answer.	3	3	12
OR					
6.	**a).**	How do usability and accessibility considerations shape the design evaluation process? Provide relevant examples.	3	3	6
	b).	Discuss the role of architectural styles and assessment of alternative designs in creating effective software architecture with examples.	3	3	6
UNIT-IV					
7.	**a).**	Evaluate the key elements of Software Quality Assurance (SQA) and discuss how SQA processes, product characteristics, and statistical methods are used to achieve and measure software reliability with	4	3	6

		suitable examples.			
	b).	Using relevant scenarios demonstrate the role of planning and recordkeeping in software testing.	4	3	6
OR					
8.	**a).**	Demonstrate with examples how review metrics and different types of reviews contribute to improving software quality.	4	3	6
	b).	Compare and contrast white box testing and black box testing techniques. Discuss in which situations each technique is most appropriate and why.	4	3	6
UNIT-V					
9.	**a).**	How does regression testing help in maintaining software quality during iterative development?	5	2	6
	b).	Explain the specific issues involved in web application testing and web testing strategies.	5	2	6
OR					
10.	**a).**	Discuss key mobile testing guidelines and strategies. How do challenges in user experience testing and performance testing affect the quality of mobile applications?	5	2	6
	b).	How do product, process, and project metrics contribute to effective software testing and maintenance?	5	2	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

Course Code: D25159B0

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) **R25**

I M.Tech I Semester MODEL QUESTION PAPER

TIME SERIES ANALYSIS

COMPUTER SCIENCE AND TECHNOLOGY

Computer Science & Technology

Time: 3 Hrs. **Max. Marks: 60 M**

Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

Assume suitable data if necessary

Q. No.			CO	KL	M
		UNIT-1			
1.	**a).**	Define a time series and explain its significance in forecasting.	1	2	6
	b).	List and describe the different types of data used in time series analysis.	1	2	6
		OR			
2.	**a).**	Outline the steps involved in the forecasting process.	1	2	6
	b).	Discuss the various resources available for forecasting and their applications.	1	2	6
		UNIT-2			
3.	**a).**	Construct a time series plot for the following data: Year | 2015 | 2016 | 2017 | 2018 | 2019 Sales (in Units) | 100 | 150 | 200 | 250 | 300 Interpret the trend observed in the plot.	2	3	6
	b).	Plot a time series graph showing the monthly average temperatures of a city over a year. Use hypothetical data of your choice. Analyze the seasonal variations and overall trend in the graph.	2	3	6
		OR			
4.	**a).**	Distinguish between Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE) in time series forecasting.	2	4	6
	b).	Explain the difference between stationary and non-stationary time series and why this distinction is important in forecasting.	2	2	6
		UNIT-3			
5.	**a).**	Explain the purpose of regression models in analyzing time series data.	3	2	6
	b).	Explain how statistical inference is applied in linear regression to make conclusions about relationships between variables.	3	2	6
		OR			
6.	**a).**	Explain the difference between ordinary least squares, generalized least squares, and weighted least squares in time series modeling.	3	2	6

	b).	Explain the concept of exponential smoothing in forecasting and how it differs from linear regression approaches.	3	2	6
UNIT-4					
7.	**a).**	Apply suitable transformations to a non-stationary time series dataset to make it stationary for ARIMA modeling.	4	3	6
	b).	Explain the concept of seasonal ARIMA models and how they differ from non-seasonal ARIMA.	4	4	6
OR					
8.	**a).**	Explain the process of forecasting using ARIMA and seasonal ARIMA models.	4	2	6
	b).	Illustrate the steps involved in forecasting internet user data using an ARIMA model.	4	2	6
UNIT-5					
9.	**a).**	Summarize the differences between univariate and multivariate time series models.	5	2	6
	b).	Compare VAR and VARIMA models in multivariate time series forecasting.	5	2	6
OR					
10.	**a).**	Illustrate how spectral analysis is used to understand multivariate time series.	5	2	6
	b).	Summarize how Bayesian methods improve forecasting in multivariate time series.	5	2	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25159B1
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.TECH. I SEMESTER Model Question Paper					
HIGH PERFORMANCE COMPUTING					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	a).	Differentiate between shared memory and distributed memory architectures using a diagram	1	3	6
	b).	Explain the concept of implicit parallelism with examples	1	3	6
OR					
2.	a).	Demonstrate the use of multithreading in a multi-core system for improving the performance of a web server.	1	3	6
	b).	Apply Amdahl's Law to compute the speedup of a program where 75% can be parallelized on 4 processors.	1	3	6
UNIT-II					
3.	a).	Compare task parallelism and data parallelism using a simple real-life example.	2	3	6
	b).	Illustrate the need for synchronization when multiple GPU threads access shared memory during a matrix operation.	2	3	6
OR					
4.	a).	Design a GPU-based parallel solution for image edge detection using convolution. Explain thread organization, memory usage, and performance benefits.	2	4	12
UNIT-III					
5.	a).	Demonstrate the working of a prefix-sum operation using an example with 4 processors.	3	3	6
	b).	Explain the importance of synchronization in multithreaded programs. Apply the concept using a critical section example.	3	3	6
OR					
6.	a).	Demonstrate how shared and private variables are used in OpenMP. Apply this in a loop parallelization example.	3	3	6
	b).	Explain how All-to-One reduction works. Apply it to compute the global sum of values distributed across processors.	3	3	6
UNIT-IV					

7.	a).	Explain the different sources of overhead in parallel programs.	4	2	6
	b).	Explain the basic steps involved in matrix-vector multiplication.	4	2	6
OR					
8.	a).	Explain the term “minimum cost” in parallel program design. How does it affect resource usage?	4	2	6
	b).	Differentiate between sequential and parallel approaches to matrix multiplication.	4	3	6
UNIT-V					
9.	a).	Explain how bubble sort can be parallelized. What are its limitations on parallel architectures?	4	2	6
	b).	Describe how memory management is handled in CUDA programming.	4	2	6
OR					
10.	a).	Explain the hierarchical organization of threads in CUDA. What are thread blocks and grids?	4	2	6
	b).	Describe how parallel depth-first search (DFS) works. How is it different from the sequential DFS?	4	2	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25159B2
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. I Semester Model Question Paper					
AGILE METHODOLOGIES					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	**a).**	Describe the meaning of "No Silver Bullet" in software development and how Agile approaches address this challenge.	1	2	6
	b).	Explain what is meant by "Individuals and Interactions over Processes and Tools" and why this principle is important in Agile.	1	2	6
OR					
2.	**a).**	Describe where to start when adopting a new Agile methodology and why understanding the overall framework is crucial.	1	2	6
	b).	What is the purpose behind each practice in Agile, and how do they collectively support project success?	1	2	6
UNIT-II					
3.	**a).**	Explain the significance of the 12 principles of Agile software development and their impact on project delivery.	2	2	12
OR					
4.	**a).**	Illustrate how better communication practices can improve team collaboration using the Ebook Reader Project as an example.	2	2	6
	b).	Explain the importance of creating a better working environment for Agile project teams and its effect on project execution.	2	2	6
UNIT-III					
5.	**a).**	Discuss the importance of the Daily Scrum and how the whole team's participation contributes to project visibility and progress.	3	2	6
	b).	Discuss challenges a team may face when sprinting into obstacles and how Scrum practices support overcoming these challenges.	3	2	6
OR					
6.	**a).**	Explain the concept of collective commitment in Scrum and its impact on sprint planning and execution.	3	2	6
	b).	Describe the roles of the Scrum Master and Product Owner in guiding team decisions and value delivery.	3	2	6
UNIT-IV					

7.	**a).**	Examine the concept of "code smells" and antipatterns in XP. How do practices like refactoring and continuous integration help in maintaining incremental design quality?	4	2	6
	b).	Discuss how feedback loops in XP contribute to continuous improvement in planning and practices. Illustrate with scenarios from software development.	4	2	6
		OR			
8.	**a).**	How does incremental design facilitate system growth in XP through simple interactions	4	2	6
	b).	Explain how trust among team members and sufficient thinking time influence the effectiveness of XP teams and their design decisions.	4	2	6
		UNIT-V			
9.	**a).**	Explain the concept of Lean Thinking and how eliminating waste improves the overall software development process.	5	2	6
	b).	Describe the core principles of Kanban and how visualizing workflow contributes to process improvement.	5	2	6
		OR			
10.	**a).**	Explain how limiting work in progress (WIP) helps control bottlenecks and improves delivery speed in Lean and Kanban.	5	2	6
	b).	Explain the role of an Agile Coach and the principles they follow to help teams and individuals embrace change	5	2	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25159B3
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. I Semester Model Question Paper					
ADVANCED COMPILER DESIGN					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	**a).**	Draw a diagram for phases of a compiler and explain the main functions of each phase along with an example of position = initial + rate * 45. Construct the output of each phase of the compilation process.	1	3	12
OR					
2.	**a).**	Differentiate different Language Processors	1	2	6
	b).	Explain different Specifications of Tokens.	1	2	6
UNIT-II					
3.	**a).**	List the differences between Top-down and Bottom-up parsers and eliminate the left recursion in CFG with an example.	2	2	6
	b).	Explain about Recursive descent parser, give an example	2	2	6
OR					
4.	**a).**	Explain in detail about predictive parser Apply predictive parsing algorithm to construct Predictive parsing table for the following CFG E→E+T / T T→ T*F / F F→ (E) / id Test whether the string id+id*id is accepted or not	2	3	12
UNIT-III					
5.	**a).**	Consider the grammar S→(L) / a L→L,S / S Apply Shift Reduce parsing for input string (a, (a, a))	3	3	6
	b).	Differentiate LR and LL parsers	3	2	6
OR					
6.	**a).**	Explain in detail about SLR Parsing. Apply SLR Parsing algorithm to construct SLR parsing table S→AA A→aA/b Test whether the string bab is accepted or not	3	3	12

UNIT-IV					
7.	**a).**	Explain Syntax- Directed Translation Schemes	4	2	6
	b).	Explain Implementing L-Attributed SDD's.	4	2	6
OR					
8.	**a).**	Explain different Variants of Syntax Trees	4	2	6
	b).	Consider the expression a = (b + (-c)) *(b +(-c)) * (c + (- b)) Construct Quadruples, triples and indirect triples	4	3	6
UNIT-V					
9.	**a).**	Explain about Activation Records give an example	5	2	6
	b).	Explain about the principle sources of optimization	5	2	6
OR					
10.	**a).**	Explain about basic block optimization	5	2	6

	b).	Explain dead code elimination
		Consider the following code and identify any dead code, if there is any dead code write the optimized program with no dead code
		`int main()`
		`{`
		`x = 2`
		`if (x > 2)`
		`cout << "code"; // Dead code`
		`else`
		`cout << "Optimization";`
		`return 0;`
		`}`
			5	3	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A,B splits** or as a **Single Question** for 12 marks

					Course Code: D2525901
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech. II Semester Model Question Paper			
		MACHINE LEARNING			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
			CO	KL	M
		UNIT-I			
1.	**a).**	Explain the stages in Machine Learning	1	2	6
	b).	Explain the different types of data used in Machine Learning.	1	2	6
		OR			
2.	**a).**	Describe Model Evaluation and its importance in ML	1	2	6
	b).	What is Feature Engineering? Explain its role with examples.	1	2	6
		UNIT-II			
3.	**a).**	Explain filter method in feature selection.	2	2	6
	b).	Describe the working principle of the K-Nearest Neighbor (KNN) classifier.	2	2	6
		OR			
4.	**a).**	Differentiate between similarity and distance measures with examples.	2	2	6
	b).	Explain Radius Distance Nearest Neighbor algorithm with example	2	2	6
		UNIT-III			
5.	**a).**	Explain Radius Distance Nearest Neighbor Algorithm with an example.	3	2	6
	b).	Illustrate KNN Regression with an example.	3	2	6
		OR			
6.	**a).**	Apply Information gain metric to generate decision tree for the following dataset **RID Age Income Student Credit_rating Buys_computer** 1 youth high no fair no 2 youth high no excellent no 3 middle_aged high no fair yes 4 senior medium no fair yes 5 senior low yes fair yes 6 senior low yes excellent no 7 middle_aged low yes excellent yes 8 youth medium no fair no	3	2	6

		9 youth low yes fair yes 10 senior medium no fair yes			
	b).	Consider the following training data and classify the pattern using Naive Bayes Classifier. **Pattern** | **Feature 1** | **Feature 2** | **Feature 3** | **Class** 1 | 0 | 0 | 0 | C0 2 | 1 | 0 | 1 | C1 3 | 1 | 0 | 0 | C0 4 | 1 | 1 | 1 | C1 5 | 0 | 1 | 1 | C1 6 | 0 | 1 | 1 | C0 7 | 1 | 0 | 1 | ?	3	3	6
UNIT-IV					
7.	**a).**	Explain the concept of Linear Discriminants in Machine Learning.	4	2	6
	b).	Illustrate Support Vector Machines with kernel trick.	4	3	6
OR					
8.	**a).**	Explain about Linear Regression	4	3	6
	b).	Explain the Perceptron Learning Algorithm with its steps.	4	3	6
UNIT-V					
9.	**a).**	Apply K-Means Clustering with two iterations to form clusters by taking the initial cluster centers as points P1 and P4 on the following dataset to partition into two clusters. P1(1,1), P2(2,2), P3(3,4), P4(5,7), P5(3,5), P6(4,5), P7(4,6).	5	3	6
	b).	Explain Agglomerative Clustering method	5	3	6
OR					
10.	**a).**	Explain the concept of Spectral Clustering.	5	3	6
	b).	Differentiate between soft clustering and hard clustering.	5	3	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

				Course Code: D2525902	
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech. II Semester Model Question Paper			
		GENERATIVE AI			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
		UNIT-1	CO	KL	M
1.	**a).**	Differentiate between **Generative and Discriminative modelling** with suitable examples.	**1**	**2**	**6**
	b).	Explain the **importance of probabilistic modelling** in Generative AI.	**1**	**2**	**6**
		OR			
2.	**a).**	Illustrate different **types of Generative models** such as GANs, VAEs, and autoregressive models.	**1**	**2**	**6**
	b).	Discuss the **ethical aspects and challenges** of Generative AI.	**1**	**2**	**6**
		UNIT-2			
3.	**a).**	Explain the **Transformer architecture** with a neat diagram.	**2**	**2**	**6**
	b).	Describe **prompt engineering strategies** with examples.	**2**	**2**	**6**
		OR			
4.	**a).**	Compare **BERT and GPT** models in terms of architecture and applications.	**2**	**2**	**6**
	b).	Explain **Retrieval Augmented Generation (RAG)** and its advantages.	**2**	**2**	**6**
		UNIT-3			
5.	**a).**	Apply the concept of **Generative Adversarial Networks (GANs)** to generate simple images.	**3**	**3**	**6**
	b).	Demonstrate how **mode collapse** can occur in GAN training with an example.	**3**	**3**	**6**
		OR			
6.	**a).**	Implement the working of a **Variational Autoencoder (VAE)** for image reconstruction.	**3**	**3**	**6**
	b).	Apply the principle of **Stable Diffusion** to generate high-resolution images.	**3**	**3**	**6**
		UNIT-4			
7.	**a).**	Apply **Cyclic GAN** to convert images from one artistic style to another.	**4**	**3**	**6**
	b).	Demonstrate **Neural Style Transfer** using a practical example.	**4**	**3**	**6**

		OR			
8.	**a).**	Apply **MuseGAN** to create a short piece of music.	**4**	**3**	**6**
	b).	Use **Deep Q-Learning** to design a simple generative agent.	**4**	**3**	**6**
		UNIT-5			
9.	**a).**	Explain the role of **Hugging Face and LangChain** in fine-tuning Generative AI models.	**5**	**2**	**6**
	b).	Describe **Open Source Generative Models (LLaMA, GPT-4All, Copilot)**.	**5**	**2**	**6**
		OR			
10.	**a).**	Explain the process of **transfer learning and fine-tuning pretrained models** in Generative AI.	**5**	**2**	**6**
	b).	Discuss the challenges of **deployment of Generative AI models**.	**5**	**2**	**6**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D2525903
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech. II Semester Model Question Paper			
		QUNATUM SCIENCE &TECHNOLOGY			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
			CO	KL	M
		UNIT-I			
1.	**a).**	Understand the photoelectric effect and blackbody radiation.	1	2	6
	b).	Illustrate step potentials, infinite potential wells, and free particles.	1	2	6
		OR			
2.	**a).**	Briefly relate the Schrödinger equation of quantum mechanics to the De Broglie hypothesis.	1	2	6
	b).	Summarize the location, momentum, and Hamiltonian of quantum mechanics as operators and observables.	1	2	6
		UNIT-II			
3.	**a).**	Designate quantum information theory, including the differences between classical and quantum information.	2	2	6
	b).	Reviewing quantum circuit notation and models.	2	3	6
		OR			
4.	**a).**	Illustrate the Qubit representation with the Bloch sphere.	2	2	6
	b).	Examination of composite systems, tensor products, and Dirac notation (bra-ket); Bell states and the EPR conundrum.	2	3	6
		UNIT-III			
5.	**a).**	Examine the limitations and review of classical computing in relation to quantum computing.	3	3	6
	b).	Discuss about the Deutsch-Jozsa and Deutsch algorithms.	3	2	6
		OR			
6.	**a).**	Explain about quantum interference and parallelism.	3	2	6
	b).	Talk about the overview and importance of Shor's factoring algorithm.	3	3	6
		UNIT-IV			
7.	**a).**	Discuss about the QFT, or quantum Fourier transform.	4	2	6
	b).	What is the 9-qubit code for the Shor?	4	3	6
		OR			

8.	**a).**	Quantum error correction: what is it? Phase-flip and bit-flip	4	2	6
	b).	What is quantum programming? Give a quick explanation of Qiskit and Cirq.	4	3	6
UNIT-V					
9.	**a).**	Describe the applications and technologies of quantum computing. Gravimetry and magnetometry are examples of quantum sensors.	5	2	6
	b).	Summarize the hardware platforms, which include photonic quantum processors, trapped ions, and superconducting qubits.	5	3	6
OR					
10.	**a).**	Explain quantum metrology, including atomic clocks, standard time, and quantum imaging and lithography.	5	2	6
	b).	Explain the international projects, such as D Wave, IonQ, IBM, Google, and India's NQM; discuss the moral dilemmas and possible advancements in the future.	5	3	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25259A0
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M. Tech. II Semester Model Question Paper					
FEATURE ENGINEERING					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	**a).**	Draw and explain a practical ML pipeline for a credit risk prediction model, specifying at least three feature engineering techniques used at different stages.	1	2	6
	b).	Discuss various feature scaling and normalization techniques, Illustrate each method with suitable examples.	1	3	6
OR					
2.	**a).**	Describe different types of data, ML tasks, and model types, and their influence on feature representation.	1	2	6
	b).	Explain interaction features and feature selection methods with suitable use cases.	1	3	6
UNIT-II					
3.	**a).**	Using the sentence "Machine learning is great", generate the Bag-of-Words and bigram representations. Explain the pros/cons of each for classification tasks.	2	3	6
	b).	Discuss the TF-IDF transformation process and its role in improving classification performance.	2	3	6
OR					
4.	**a).**	Explain tokenization, stemming, and stopword removal in text preprocessing with examples.	2	2	6
	b).	Illustrate the effect of feature scaling on Bag-of-Words features using TF-IDF with logistic regression.	2	3	6
UNIT-III					
5.	**a).**	Explain the mathematical derivation and intuition behind Principal Component Analysis (PCA).	3	2	6
	b).	Discuss whitening and ZCA transformations along with their applications and limitations.	3	3	6
OR					
6.	**a).**	Compare and contrast one-hot encoding, dummy coding, and effect coding for categorical variables.	3	2	6

	b).	Describe feature hashing and bin counting methods for handling high-cardinality categorical features.	3	3	6
UNIT-IV					
7.	**a).**	Explain k-means clustering and its use in non-linear featurization.	4	2	6
	b).	Describe alternative dense featurization techniques and discuss their pros and cons.	4	3	6
OR					
8.	**a).**	Discuss the concept of model stacking and how clustering-based features can improve performance.	4	3	6
	b).	Explain potential pitfalls (gotchas) in using k-means featurization with examples.	4	3	6
UNIT-V					
9.	**a).**	Describe the process of building an item-based collaborative filtering recommender system.	5	2	6
	b).	Explain the Academic Paper Recommender System – describe the initial naive approach, its implementation process, and discuss the limitations that affect recommendation accuracy.	5	3	6
OR					
10.	**a).**	Discuss the steps and feature engineering improvements made in the second and third iterations of the academic paper recommender system.	5	3	6
	b).	Explain how adding more features can improve recommendation accuracy with suitable justification.	5	3	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25259A1
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M. Tech II Semester MODEL QUESTION PAPER					
NATURAL LANGUAGE PROCESSING					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
Q. No.			**CO**	**KL**	**M**
UNIT-1					
1.	**a).**	Apply your understanding of NLP challenges to analyze why ambiguity and context are problems in language modeling.	1	3	6
	b).	Compare grammar-based and statistical language models with examples.	1	4	6
OR					
2.	**a).**	Apply English morphology rules using transducers to analyze word forms like "running," "played," and "happier."	1	3	6
	b).	Apply minimum edit distance to correct the misspelled word “recieve” into its correct form “receive.”	1	3	6
UNIT-2					
3.	**a).**	Evaluate the performance of unsmoothed vs smoothed N-grams in predicting words for a given corpus.	2	5	6
	b).	Analyze how interpolation and backoff improve unseen word handling compared to raw frequency counts.	2	4	6
OR					
4.	**a).**	Design a strategy to handle ambiguity in PoS tagging when a word can belong to multiple classes.	2	6	6
	b).	Evaluate HMM and Maximum Entropy models for PoS tagging on sparse data.	2	5	6
UNIT-3					
5.	**a).**	Explain how context-free grammars represent English syntax with suitable examples.	3	2	6
	b).	Explain dependency grammar with suitable examples.	3	2	6
OR					
6.	**a).**	Explain how ambiguity arises in syntactic parsing with an example sentence.	3	2	6
	b).	Analyze the role of dynamic programming in parsing using the CYK algorithm.	3	2	6

UNIT-4					
7.	**a).**	Identify the thematic roles in the sentence *"The doctor treated the patient with medicine,"* and analyze possible ambiguities.	4	3	6
	b).	Summarize the different types of word relations: synonymy, antonymy, and hyponymy with examples.	4	2	6
OR					
8.	**a).**	Compare and evaluate dictionary-based and bootstrapping methods of word sense disambiguation for rare words in a given corpus.	4	2	6
	b).	Analyze the similarity score between the words *doctor–nurse* and *doctor–banana* using distributional methods.	4	4	6
UNIT-5					
9.	**a).**	Analyze how the centering algorithm helps maintain coherence in a short multi-sentence discourse.	5	4	6
	b).	Classify the coreferences in a sample text and model their relationships for resolution	5	4	6
OR					
10.	**a).**	Evaluate the effectiveness of Porter Stemmer versus a Lemmatizer for preprocessing text in an NLP pipeline.	5	4	6
	b).	Analyze the output of a Porter Stemmer and a Lemmatizer on the words: *running, better, studies*, and write the differences in their results.	5	4	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25259A2
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. II Semester Model Question Paper					
ADHOC SENSOR NETWORKS					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	**a).**	Explain the characteristics of Mobile Ad Hoc Networks?	1	2	6
	b).	List and brief the various applications of MANETs?	1	2	6
OR					
2.	Describe the working principle of WSN? Explain its architectures with a neat sketch?		1	3	12
UNIT-II					
3.	**a).**	What are the Issues in designing a MAC Protocol?	2	2	6
	b).	List out the Design Goals of a MAC Protocol for Ad Hoc Wireless Networks?	2	4	6
OR					
4.	**a).**	Explain Contentionbased protocols with Scheduling Mechanisms?	2	2	6
	b).	Describe the Multi-channel MAC –IEEE 802.11?	2	4	6
UNIT-III					
5.	**a).**	What are the issues in designing a routing protocol for adhoc networks?	3	2	6
	b).	Write a short note on hybrid routing protocol?	3	4	6
OR					
6.	Explain how TCP is used in Ad Hoc Networks?		3	4	12
UNIT-IV					
7.	**a).**	Mention any four applications of WSN?	4	2	4
	b).	Draw the architecture diagram of Great Duck Island application?	4	3	8
OR					
8.	**a).**	Difference Between FDMA, TDMA and CDMA?	4	4	8
	b).	What are the data aggregation strategies in WSN?	4	2	4
UNIT-V					
9.	**a).**	What are the Issues in WSN routing?	5	2	6
	b).	Write a short note on OLSR?	5	4	6

		OR			
10.	**a).**	What is QoS in WSN? Mention its challenges?	5	2	6
	b).	Describe in brief energy-efficient design process?	5	4	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

		Course Code: D25259A3			
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. II Semester MODEL QUESTION PAPER					
CRYPTOGRAPHY & NETWORK SECURITY					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
		UNIT-1	CO	KL	M
1.	**a).**	Draw a neat sketch and explain the model of network security	**1**	**2**	**6**
	b).	Differentiate Substitution techniques, Transposition techniques	**1**	**2**	**6**
		OR			
2.	**a).**	Differentiate Active attacks and Passive attacks.	**1**	**2**	**6**
	b).	Describe different security services and security mechanisms	**1**	**2**	**6**
		UNIT-2			
3.	**a).**	What is GF(2^n) fields. Why it is important in symmetric key cryptography	**2**	**2**	**6**
	b).	Explain Fermat's Little Theorem, apply Fermat's Little Theorem to compute $\mathbf{3^{100}}$ **mod (7)**	**2**	**3**	**6**
		OR			
4.	**a).**	Explain Algebraic Structures-Groups, Rings, Fields. How they are applied in cryptography	**2**	**2**	**6**
	b).	Explain Chinese Remainder Theorem, explain how it is useful in cryptography	**2**	**2**	**6**
		UNIT-3			
5.	**a).**	Explain key generation process in DES algorithm with neat diagram.	**3**	**2**	**6**
	b).	Apply DiffieHellman Key exchange algorithm to find the secret key shared between User A and User B for the following: q=97, a=5, the private keys X A = 36, X B = 58.	**3**	**3**	**6**
		OR			
6.	**a).**	Explain the structure of AES algorithm with neat diagram and describe the steps in AES encryption**.**	**3**	**2**	**6**
	b).	Apply RSA algorithm to perform Encryption and Decryption for p=17,q=11,e=7,M=8.	**3**	**3**	**6**

		UNIT-4			
7.	**a).**	List and explain various steps of SHA in detail with neat diagram.	**4**	**2**	**6**
	b).	Describe digital signature algorithm with neat diagram and explain how tosign and verify using DSS algorithm.	**4**	**2**	**6**
		OR			
8.	**a).**	Explain HMAC algorithm with neat diagram	**4**	**2**	**6**
	b).	Describe schemes to provide digital signature.	**4**	**2**	**6**
		UNIT-5			
9.	**a).**	Discuss in detail about SSL/TLS.	**5**	**2**	**6**
	b).	Discuss in detail about Email Format, Email Threats and Comprehensive Email Security	**5**	**2**	**6**
		OR			
10.	**a).**	Describe in detail about web security	**5**	**2**	**6**
	b).	Discuss the services provided by PGP with neat diagram.	**5**	**2**	**6**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25259B0
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. II Semester Model Question Paper					
BLOCK CHAIN TECHNOLOGIES					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	**a).**	Explain the **origins of Blockchain** with special reference to Bitcoin.	1	2	6
	b).	Discuss the role of **SHA256 and ECDSA** in block chain security.	1	2	6
OR					
2.	**a).**	Compare **symmetric and asymmetric cryptography** in block chain.	1	2	6
	b).	Describe the concept of **permissioned vs permissionless platforms.**	1	2	6
UNIT-II					
3.	**a).**	Explain how **Merkle Trees** are used in block chain to ensure data integrity.	2	2	6
	b).	Discuss the concept of **double spending** and the mechanisms to prevent it.	2	2	6
OR					
4.	**a).**	Explain the working of a **Bitcoin wallet** and its importance.	2	2	6
	b).	Discuss the **challenges of mining** in the Bitcoin network.	2	2	6
UNIT-III					
5.	**a).**	Explain the working principle of **Proof of Work (PoW)** consensus mechanism.	3	2	6
	b).	Compare **PoW and PoS** consensus algorithms.	3	2	6
OR					
6.	**a).**	Discuss the concept of **Byzantine Fault Tolerance** in block chain.	3	2	6
	b).	Explain the **hybrid models** combining PoW and PoS.	3	2	6
UNIT-IV					
7.	**a).**	Explain the concept of **Ethereum Virtual Machine (EVM).**	4	2	6
	b).	Discuss the **differences between Bitcoin scripting and Ethereum smart contracts.**	4	2	6
OR					
8.	**a).**	Describe the **characteristics of Solidity** as a smart contract language.	4	2	6
	b).	Explain **security issues and attacks on smart contracts** with examples.	4	2	6

UNIT-V					
9.	**a).**	Explain the role of **Hyperledger Fabric** as a permissioned block chain platform.	5	2	6
	b).	Discuss the **applications of blockchain in e-Governance**.	5	2	6
OR					
10.	**a).**	Discuss the **limitations of blockchain technology.**	5	2	6
	b).	Explain the role of block chain in **cybersecurity and data integrity.**	5	2	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D25259B1
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
I M.Tech. II Semester Model Question Paper					
DevOps					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-I					
1.	**a).**	Explain how the Agile model supports the Software Development Life Cycle (SDLC) and how DevOps practices further enhance the process.	1	2	6
	b).	Compare Scrum and Kanban as Agile methodologies. How do they support DevOps practices and improve the delivery pipeline?	1	2	6
OR					
2.	**a).**	Discuss the principles of workflow automation in DevOps, including build automation, delivery automation, and code quality.	1	2	6
	b).	Discuss how bottlenecks can be identified and managed within a DevOps delivery pipeline.	1	2	6
UNIT-II					
3.	**a).**	Explain the significance of GIT features such as staging, branching, and pull requests in facilitating source code management and streamlined team collaboration.	2	2	6
	b).	Compare and contrast the use of local vs. remote repositories in GIT.	2	3	6
OR					
4.	**a).**	Examine the role of automated unit testing (e.g., using Junit, nUnit) and continuous code coverage analysis (with SonarQube) in maintaining code quality. Provide examples of how these tools can be integrated with source code management systems.	2	3	6
	b).	Explain how can teams manage roles and code contributions effectively during migrating source code from a legacy version control system to GIT?	2	2	6
UNIT-III					
5.	**a).**	Explain how build automation and continuous integration contribute to early error detection, faster feedback, and reliable software delivery. Use Jenkins as an example to support your answer.	3	3	6
	b).	Discuss how the integration of build automation, CI tools, and user management practices supports continuous integration and reliable code deployment in software projects.	3	2	6

		OR			
6.	**a).**	Examine how Jenkins Pipelines (including nodes, agents, and executors) facilitate complex CI/CD workflows, referencing both freestyle projects and pipeline projects.	3	2	6
	b).	Evaluate the architectural design and workflow of Jenkins as a continuous integration tool.	3	3	6
		UNIT-IV			
7.	**a).**	Analyze code quality management in a CD pipeline using Docker and automated testing tools.	4	3	6
	b).	Explain the architecture and workflow for running and publishing Docker containers as part of the continuous deployment process.	4	2	6
		OR			
8.	**a).**	Examine how automated testing tools such as Selenium and JavaScript testing frameworks improve the effectiveness of continuous delivery pipelines. Give examples illustrating their integration and benefits.	4	3	6
	b).	Compare and contrast manual and automated deployment practices in terms of speed, reliability, and error reduction.	4	2	6
		UNIT-V			
9.	**a).**	Discuss how CI/CD pipelines are implemented on OpenShift (OCP) using build configs (BC), deployment configs (DC).	5	2	6
	b).	Examine the role of secure secrets management in deployment automation using Ansible Vault and Kubernetes secrets.	5	2	6
		OR			
10.	**a).**	Compare and contrast the approaches of Puppet master and Chef with Ansible for configuration management.	5	2	6
	b).	Discuss the advantages and challenges of using namespaces, config maps, and pods for application deployment.	5	2	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

				Course Code: D25259B2	
		SAGIRAMAKRISHNAMRAJUENGINEERINGCOLLEGE(A)			**R25**
		IM. Tech. II Semester MODEL QUESTION PAPER			
		SECURE CODING			
		Computer Science & Technology			
Time:3 Hrs.				**Max.Marks:60 M**	
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
		UNIT-1	CO	KL	M
1.	**a).**	Why are computer systems security needed today and what problems can happen if they are not secure?	1	2	6
	b).	How does implementing proactive security in software development enhance overall software quality and reduce future risks?	1	2	6
		OR			
2.	**a).**	How can the security ideas of defense in depth, least privilege and reducing the attack surface be used in a real project? Explain each with an example.	1	3	6
	b).	What is threat modelling and its use in finding security problems during system design?	1	2	6
		UNIT-2			
3.	**a).**	Discuss how string manipulation vulnerabilities in C can lead to security exploits. Provide relevant examples.	2	2	6
	b).	What problems can null byte attacks cause in C programs and what can be done to stop them?	2	2	6
		OR			
4.	**a).**	Apply secure coding practices to pointers and justify how they help prevent related exploits.	2	3	6
	b).	Propose and explain strategies for preventing buffer overflow attacks In C code. Evaluate the effectiveness of these strategies.	2	3	6
		UNIT-3			
5.	**a).**	Explain how dynamic memory allocation works in C++ compared to Java.	3	2	6
	b).	Summarize the common errors in dynamic memory management in C++.	3	2	6
		OR			
6.	**a).**	Explain common integer vulnerabilities such as overflow and Underflow in C++.	3	2	6
	b).	Summarize mitigation strategies against common dynamic memory Vulnerabilities.	3	2	6
		UNIT-4			
7.	**a).**	Differentiate between single and double quoting in SQL queries and	4	2	6
		Discuss their roles in secure coding.			

	b).	Explain the difference between stored procedures and dynamic SQL Statements in terms of security.	4	2	6
		OR			
8.	**a).**	Discuss the risks associated with building SQL statements using String concatenation.	4	2	6
	b).	Explain what Cross Site Scripting (XSS) attacks are and how they can Impact a web application.	4	2	6
		UNIT-5			
9.	**a).**	Illustrate with an example how unclear requirements can lead to Security vulnerabilities in a software system.	5	3	6
	b).	Explain the concept of misuse and abuse cases in the context of Secure software engineering.	5	2	6
		OR			
10.	**a).**	Summarize the steps involved in the SQUARE process model for security requirements engineering	5	2	6
	b).	Apply security design principles to enhance the security of a proposed Application architecture.	5	3	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

		Course Code: D25259B3			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R25**
		I M.Tech. II Semester MODEL QUESTION PAPER			
		DESIGN PATTERN			
		Computer Science & Technology			
Time: 3 Hrs.					**Max. Marks: 60 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
		UNIT-1	CO	KL	M
1.	**a).**	What is design pattern? Describe in detail about the essential elements of the design pattern.	1	2	8
	b).	Explain design patterns in Smalltalk MVC.	1	2	4
		OR			
2.	**a).**	How Design Problems are solved by Design patterns?	1	3	6
	b).	How to Select and use a Designpattern?	1	3	6
		UNIT-2			
3.	**a).**	What is a design problem? Explain document structure?	2	2	6
	b).	Explain supporting and multiple look-and-feel standards?	2	2	6
		OR			
4.		Consider any application of Case study? How to support the Document editor design patterns?	2	4	12
		UNIT-3			
5.	**a).**	What is the motivation for adapter pattern? Explain it in detail.	3	2	6
	b).	Explain the applicability and structure of a bridge design pattern.	3	2	6
		OR			
6.		What is a Proxy design pattern? Discuss about the consequences and implementation issues of a proxy pattern?	3	3	12
		UNIT-4			
7.	**a).**	Briefly explain about the issues that should be considered while implementing the chain of Responsibility pattern.	4	4	8
	b).	Discuss in detail about the applicability of a command pattern	4	3	4
		OR			
8.	**a).**	Explain in detail about memento design pattern.	4	2	6
	b).	Describe in detail about mediator design pattern.	4	3	6

		UNIT-5			
9.	What is a visitor pattern? Explain in detail about the visitor object behavioral pattern.		5	2	12
		OR			
10.	**a).**	Illustrate the Brief History of Design Patterns.	5	4	6
	b).	Illustrate concept of The Pattern Community.	5	4	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks

					Course Code: D2535901
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R25**
II M.Tech. I Semester MODEL QUESTION PAPER					
RESEARCH METHODOLOGY AND IPR					
Computer Science & Technology					
Time: 3 Hrs.					**Max. Marks: 60M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
UNIT-1					
1.	**a).**	Write briefly about good Research criteria.	1	2	6
	b).	What are the errors in selecting a research problem?	1	2	6
OR					
2.	**a).**	Describe briefly the Research process with a neat sketch.	1	2	6
	b).	Describe the scope and objectives of research problems in academic and industrial contexts.	1	3	6
UNIT-2					
3.	**a).**	Write briefly about Effective Literature studies approaches.	2	2	6
	b).	Explain about Research ethics.	2	2	6
OR					
4.	**a).**	Write briefly about Effective technical writing.	2	3	6
	b).	Explain about the Format of research proposal.	2	3	6
UNIT-3					
5.	**a).**	Write about the various steps in acquisition of trademarks rights.	3	2	6
	b).	Discuss research ethics and its role in maintaining academic integrity.	3	3	6
OR					
6.	**a).**	Write briefly about International cooperation on Intellectual Property.	3	2	6
	b).	Explain the procedure for grants of patents.	3	2	6
UNIT-4					
7.	**a).**	Explain about patent information and databases.	4	2	6
	b).	Define Intellectual Property Rights (IPR) and explain patents, designs, trademarks, and copyrights.	4	2	6
OR					
8.	**a).**	Write briefly about scope of patent rights.	4	2	6
	b).	Write briefly about Licensing and transfer of technology.	4	2	6
UNIT-5					
9.	**a).**	Write briefly about Administration in the patent system.	5	2	6
	b).	Explain the scope of patent rights, licensing, and technology transfer.	5	3	6
OR					
10.	**a).**	Write briefly about New developments in IPR.	5	2	6

	b).	Explain IPR case studies involving IITs and their significance in technology commercialization	5	3	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as **A, B splits** or as a **Single Question** for 12 marks