H.T No: | | | | | | | | | | | R22

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Computer Networks**
Course Code : **A405310/ A467305/ A466304/ A473303**
Branch : **CSE/ CSD/ CSM/ AIM**
Date & Session : **30-06-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What are the software structuring techniques? 1 M
2. What is Protocol? 1 M
3. What is the role of 802.11? 1 M
4. What is the use of GO BACK N? 1 M
5. Define routing. 1 M
6. What are the network layer design issues? 1 M
7. Write the services of Transport layer. 1 M
8. What is an element of a transport protocol? 1 M
9. Mention the types of HTTP messages. 1 M
10. What is the use of SNMP protocol in a network? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). What is network topology? Explain the different network topologies. 10M

OR

11. B). Explain in detail about TCP/IP protocol suite with neat diagram. 10M

12. A). Discuss in detail sliding window protocol with neat sketch. 10M

OR

12. B). Illustrate the working of CSMA / CD and CSMA/CA protocol. 10M

13. A). Discuss in details any two Shortest Path Algorithms. 10M

OR

13. B). Describe the multicast routing in detail. 10M

14. A). Discuss the operations of UDP and Explain UDP checksum with one example. 10M

OR

14. B). With a neat architecture, explain TCP in detail. 10M

15. A). Discuss in detail about DNS operation. 10M

OR

15. B). Briefly explain Electronic mail applications. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Data Communications and Computer Networks**
Course Code : **A412305**
Branch : **Information Technology**
Date & Session : **30-06-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. List the layers in OSI model. 1 M
2. Define protocol. 1 M
3. Differentiate between error detection and error correction. 1 M
4. Write about noisy channels. 1 M
5. What is tunneling? 1 M
6. What is internetworking? 1 M
7. Define QoS. 1 M
8. What is congestion? 1 M
9. Write about FTP. 1 M
10. What is DNS? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Explain in detail about a) Twisted pair cable b) Coaxial cable. 4M
ii) Describe about the various topologies in data communications. 6M

OR

11. B). i) What is multiplexing? Describe in detail about circuit switched networks. 5M
ii) Write short notes on ISDN. 5M

12. A). Write the structure of CRC encoder and decoder. Consider dataword D = 100100 and predetermined divisor P = 1101, Find the codeword C, which is to be transmitted from the sender site using CRC polynomial and verify the same at the receiver site. 10M

OR

12. B). Discuss in detail about CSMA/CD. 10M

13. A). Explain in detail about network layer at source, router and destination. 10M

OR

13. B). What is routing? Explain in detail about multicast routing protocols. 10M

14. A). List the various TCP states. Explain in detail about TCP connection management. 10M

OR

14. B). Explain in detail about the following: 10M
i) TCP ii) UDP

15. A). Write short notes on the following: 10M
i) SMTP ii) HTTP

OR

15. B). Describe in detail the Domian Name System with neat diagram. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Network Security and Cryptography**
Course Code : **A462303**
Branch : **CSC**
Date & Session : **30-06-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define Steganography. 1 M
2. Difference between Passive and Active Security Threats. 1 M
3. What is the purpose of S-Boxes in DES? 1 M
4. How keys are exchanged in Diffie- Hellman algorithm? 1 M
5. Define HMAC. 1 M
6. List out the Properties of Public Key. 1 M
7. Define Transport Layer Security? 1 M
8. Define Wireless Security. 1 M
9. What is Authentication Header? 1 M
10. Discuss about Internet Key Exchange. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Discuss about different types of various security services. 10M

OR

11. B). i) Differentiate between Symmetric and Asymmetric cryptographic techniques. 5 M
ii) Explain a model for network security. 5 M

12. A). i) Critically analyze the security of RSA. 5 M
ii) Differentiate between RC5 and Blow fish. 5 M

OR

12. B). What are the principal elements of a public-key Cryptosystem? What are the roles of public and private key. 10M

13. A). Explain About Secure hash Algorithm (SHA-512). 10M

OR

13. B). Explain message Authentication requirement and what are the attacks related to message communication. 10M

14. A). Discuss the IEEE 802.11i wireless LAN security. 10M

OR

14. B). Explain the Services provided by SSL Record Protocol. 10M

15. A). Briefly explain the scenario of IP Security and its policy. 10M

OR

15. B). i) Write in detail about S/MIME IP Security. 5 M
ii) Write about Case Study on Cryptography and security. 5 M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **DevOPS**
Course Code : **A405311**
Branch : **Computer Science & Engineering**
Date & Session : **02-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	How does the Agile development model relate to DevOps?	1 M
2.	What is the purpose of a delivery pipeline?	1 M
3.	Define business agility in the context of DevOps.	1 M
4.	How does DevOps contribute to system resilience?	1 M
5.	What is source code management, and why is it essential?	1 M
6.	Why is Docker important in DevOps project management?	1 M
7.	Define the role of build slaves in Jenkins.	1 M
8.	What is "infrastructure as code"?	1 M
9.	What is Selenium, and how does it support automated testing?	1 M
10.	Differentiate between Puppet and Ansible as deployment tools.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Describe the DevOps process in detail, covering each stage from planning to deployment.	10M
	OR	
11. B).	Describe how Agile practices can be enhanced with DevOps tools and techniques to improve efficiency.	10M
12. A).	Explain how DevOps lifecycle models impact business agility. Provide relevant examples.	10M
	OR	
12. B).	Explain the importance of architecture rules of thumb in DevOps and provide examples.	10M
13. A).	Discuss the roles and responsibilities within a source code management system.	10M
	OR	
13. B).	Design a DevOps project management workflow using GitLab, GitHub, and Docker.	10M
14. A).	Explain the different phases of the build process in DevOps.	10M
	OR	
14. B).	Design a build pipeline with Jenkins for a sample project, considering dependency order and triggers.	10M
15. A).	Explain the differences between TDD and REPL-driven development in DevOps.	10M
	OR	
15. B).	Design an end-to-end testing and deployment process using Ansible, Puppet, and Docker for a sample application.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Big Data Analytics**
Course Code : **A467302**
Branch : **CSD**
Date & Session : **02-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What are the four V's of Big Data? 1 M
2. The word 'Big data' was coined by whom and which year? 1 M
3. In which platform does Hadoop run on? 1 M
4. What mechanisms Hadoop uses to make namenode resilient to failure? 1 M
5. Which jobs are optimized for scalability but not latency? 1 M
6. "Sharding" a database across many server instances can be achieved with _____ 1 M
7. Which MongoDB operations on a single document will operate atomically? 1 M
8. Which command can be used to rebuild the indexes on a collection in MongoDB? 1 M
9. How can you read a CSV file into a data frame in R? 1 M
10. How do you comment a single line in an R script? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Compare Big Data with Business Intelligence and Warehouse. 10M

OR

11. B). Analyze the different challenges faced by Big Data and its counter measures. 10M

12. A). Discuss HDFS features, architecture and goals in detail. 10M

OR

12. B). Compare RDBMS Vs Hadoop in all aspects. 10M

13. A). Write down the Map Reduce algorithm and solve one example problem using that. 10M

OR

13. B). Analyze the key features, advantages, disadvantages, and types of NoSQL databases. 10M

14. A). Justify the necessity of MongoDB and write down its data types and any 5 operations. 10M

OR

14. B). Write a query for searching an item in a table using MongoDB, Assume your own example. 10M

15. A). Check whether the value of the element of a given vector greater than 10 or not. Return TRUE or FALSE. Write a R program for that. 10M

OR

15. B). Write the code snippet using R programming for the following: 10M
i). Access the element at 3rd column and 1st row in a matrix.
ii). Access only the second row.
iii) Access the element at 2nd column and 4th row in a matrix.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Design and Analysis of Algorithms**
Course Code : **A466302/ A473301**
Branch : **CSM/ AIM**
Date & Session : **02-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions
Each question carries ONE mark. **10x1=10M**

1. Define Algorithm. 1 M
2. What is performance measurement? 1 M
3. What is a disjoint and overlapping set? 1 M
4. List the applications of backtracking. 1 M
5. What are the features of dynamic programming? 1 M
6. Define principle of optimality. 1 M
7. What is greedy choice property? 1 M
8. What are the different traversal techniques? 1 M
9. Define branch and bound method. 1 M
10. List some NP Hard problems. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Briefly discuss about Asymptotic Notations with examples. 10M

OR

11. B). Explain about Binary Search with example and calculate it's Time Complexity. 10M

12. A). Define Disjoint set. Demonstrate union and find algorithms with an example. 10M

OR

12. B). Give the statement of sum–of subsets problem. Find all sum of subsets for n=4, (w1, w2, w3, w4) = (11, 13, 24, 7) and M=31.Draw the portion of the state space tree using fixed – tuple sized approach. 10M

13. A). What is dynamic programming. Solve 0/1 knapsack problem using dynamic programming with suitable example 10M

OR

13. B). Solve travelling salesmen problem using dynamic programming with suitable example. 10M

14. A). What is a Minimum Cost Spanning tree? Explain Kruskal's Minimum cost spanning tree algorithm with a suitable example. 10M

OR

14. B). i) Define Graph. How to represent graphs explain in detail. 5M
ii) Explain about connected & bi-connected components. 5M

(P.T.O..)

15. A). State the concept of branch and bound method. Draw the portion of the state space tree generated by LC branch and bound of knapsack problem for an instance n=4, (P1, P2, P3, P4) = (10, 10, 12, 18), (w1, w2, w3, w4) = (2, 4, 6, 9), and m=15. 10M

OR

15. B). What are the key concepts of Cook's Theorem. Demonstrate Cook's Theorem in detail. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Software Engineering**
Course Code : **A412306**
Branch : **Information Technology**
Date & Session : **02-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define SDLC. 1 M
2. What are the advantages of Waterfall model? 1 M
3. What is SRS? 1 M
4. How to validate a requirement in engineering process? 1 M
5. What is Coupling? 1 M
6. Give different UML diagrams. 1 M
7. What is Black Box Testing? 1 M
8. List the metrics for software quality. 1 M
9. What is RMMM plan? 1 M
10. Define software reliability. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). What is software myth? Explain the different myths in detail. 10M

OR

11. B). Explain waterfall model in detail. Give the advantages and disadvantages. 10M

12. A). What is SRS? Explain the structure of SRS and different components. 10M

OR

12. B). Discuss the requirement analysis and Elicitation in detail. 10M

13. A). What is Architectural style? Explain different architectural styles in detail. 10M

OR

13. B). Design a hospital management system using use case diagram, class diagram, Activity diagram, Sequence diagram. 10M

14. A). What is white box testing? Explain the different techniques in white box testing. 10M

OR

14. B). Discuss the different techniques used in black box testing. 10M

15. A). What is software risk? Explain different types of risks and risk identification. 10M

OR

15. B). Discuss Formal Technical reviews in detail. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Formal Languages & Automata Theory**
Course Code : **A462306**
Branch : **CSC**
Date & Session : **02-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is the main difference between *deterministic* and *nondeterministic* finite automata? 1 M
2. What is the role of *epsilon (ε)-transitions* in finite automata? 1 M
3. Write a regular expression for the language of strings that contain only the letters "a" and "b" and end with "ab." 1 M
4. Write a regular expression to denote a language L which accepts all the strings which begin or end with either 100 or 110. 1 M
5. Write the leftmost derivation for the string "aaabb" using the CFG: S→aS | bS | ϵ 1 M
6. What is the difference between leftmost and rightmost derivations? 1 M
7. Give a formal definition for the Turing Machine. 1 M
8. Define CFL. 1 M
9. Define Universal Turing machine? 1 M
10. Give an example for recursive and recursively enumerable languages. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Construct DFA for the given NFA. 10M

	Next state	
	0	1
→ q0	q0,q1	q0
q1	q2	q1
q2	q3	q3
(q3)	-	q2

OR

11. B). Construct the NFA for the language which accepts all and only the strings of 0's and 1's that end in 01. Obtain the equivalence DFA for it. 10M

12. A). Given the regular expression (a|b)*abb(a|b)* construct an equivalent deterministic finite automaton (DFA) and explain each step in the construction process. 10M

OR

12. B). Use the Pumping Lemma to prove that the language $L=\{a^m b^m | m \geq 1\}$ is not regular. 10M

(P.T.O..)

13. A). Design a Push Down Automaton (PDA) that accepts the language $L=\{a^nb^n|n\geq 0\}$ by empty stack. 10M

OR

13. B). Construct a CFG for the language $L=\{a^nb^nc^m|n\geq 0,m\geq 0\}$ Show the derivations for the string "aabbcc." 10M

14. A). Convert the following CFG and CNF. 10M

$S \rightarrow aB \mid bA$

$A \rightarrow a \mid aS \mid bAA$

$B \rightarrow b \mid aS \mid aBB.$

OR

14. B). Construct a TM for the language $L = \{0^n1^n2^n\}$ where $n\geq 1$. 10M

15. A). Explain the various types of Turing Machines. 10M

OR

15. B). By taking an example, prove Post Correspondence Problem. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Machine Learning**
Course Code : **A412307/ A467303/ A466303/ A473302**
Branch : **IT/ CSD/ CSM/ AIM**
Date & Session : **04-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define Machine Learning	1 M
2.	Why Supervised learning is Important	1 M
3.	Explain Neural Network with diagram.	1 M
4.	Why Backpropagation is required.	1 M
5.	Explain classification problem in Machine Learning.	1 M
6.	Give advantage of K means algorithm in clustering technique.	1 M
7.	What is Dimensionality in mining.	1 M
8.	Define selection operation in GA	1 M
9.	What is the significance of the reinforcement algorithm.	1 M
10.	Write two advantages of sampling theory.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain about Types of Machine Learning with proper examples.	10M
	OR	
11. B).	Explain about Linear Regression with proper example and advantage's.	10M
12. A).	Explain about Multi-Layer Perceptron with proper Explanation.	10M
	OR	
12. B).	Define RBF networks with real world examples.	10M
13. A).	Apply the Decision Trees with real world examples.	10M
	OR	
13. B).	How Bagging work explain with real world examples.	10M
14. A).	Compare Linear Discriminant with principal component analysis.	10M
	OR	
14. B).	Analyze Least square Optimization with real world examples	10M
15. A).	What is Sampling method with real world examples.	10M
	OR	
15. B).	Analyze Trackig method with real world examples.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Design and Analysis of Algorithms**
Course Code : **A405302**
Branch : **Computer Science & Engineering**
Date & Session : **04-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is Big-O notation? 1 M
2. What is the difference between best, worst, and average case complexities? 1 M
3. What is the role of the **root** in a disjoint set? 1 M
4. What is the difference between a forest and a disjoint set? 1 M
5. What is the time complexity of a Dynamic Programming algorithm (travelling sales person problem)? 1 M
6. Give an example of a problem that can be solved using Dynamic Programming? 1 M
7. What is an example of a problem where Greedy does not work? 1 M
8. Name algorithms used to compute minimum cost spanning trees. 1 M
9. What is the "feasible region" in Branch and Bound? 1 M
10. List any two NP-complete problems? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain the importance of analyzing algorithms. Discuss the different methods of analyzing the efficiency of algorithms. 10M

OR

11. B). Build the general approach of Divide and Conquer algorithms, and discuss the key steps involved. 10M

12. A). Interpret the Union-Find algorithm and its importance in solving graph-related problems. Discuss how the union-find data structure is implemented and the efficiency improvements made through path compression and union by rank. 10M

OR

12. B). Outline the solutions for the 4-queens problem by using the back-tracking approach. 10M

13. A). Discuss the difference between Memorization and Tabulation in Dynamic Programming. Provide examples where each technique is more suitable. 10M

OR

13. B). Outline how Dynamic Programming can be used to solve optimization problems. Apply Two different optimization problems where DP provides an efficient solution. 10M

14. A). Explain the greedy approach to the Job Scheduling Problem. Discuss how the problem is solved by using the Greedy Method and provide an example. 10M

OR

14. B). What are the key differences between tree traversal and graph traversal? 10M

15. A). Discuss the role of branching strategies in the Branch and Bound algorithm. How do different strategies impact the performance of the algorithm? 10M

OR

15. B). Analyze the implications of NP-completeness in real-world applications. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Algorithm Design and Analysis**
Course Code : **A462304**
Branch : **CSC**
Date & Session : **04-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What does it mean if an algorithm has a time complexity of O(n^2)? 1 M
2. List out any four algorithms that follows Divide and Conquer Method 1 M
3. How does a binary heap differ from a binary search tree (BST)? 1 M
4. List any two problems that can be solved using backtracking. 1 M
5. List any two applications of Dynamic Programming. 1 M
6. What is the need of Optimal Binary Search Tree? 1 M
7. Name algorithms used to compute minimum cost spanning trees. 1 M
8. List Tree Traversal techniques. 1 M
9. Compare FIFO branch bound and LC branch bound. 1 M
10. List any two NP-complete problems? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Outline the concept of time complexity and its importance in algorithm analysis 4M
ii) Compare worst-case, best-case, and average-case time complexity, providing example for each. 6M

OR

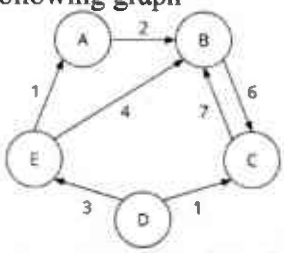
11. B). Develop an algorithm for sorting elements using simple merge. Apply the same for sorting list of elements given below:67, 90, 12, 56, 23, 34, 45. 10M

12. A). Illustrate Disjoint set operations. 10M

OR

12. B). Outline the solutions for the 4-queens problem by using the back-tracking approach. 10M

13. A). Apply Floyd' s algorithm to the following graph 10M



for computing shortest paths between every pair of vertices.

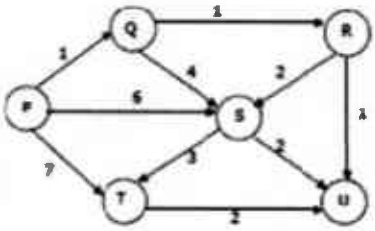
(P.T.O.)

OR

13. B). i) Compare greedy method and Dynamic Programming. 5M

ii) Analyze the time complexity of Travelling Salesman Problem using Dynamic Programming. 5M

14. A). Apply single source shortest path problem for the following graph. 10M



OR

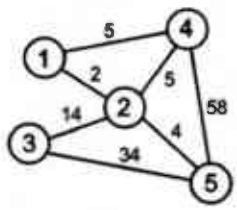
14. B). Construct tree from following tree traversals 10M

Preorder:5 3 1 2 4 6 8 7

Inorder:1 2 3 4 5 6 7 8

and also write algorithm for post order traversal.

15. A). Solve the following instance of travelling sales person problem using Least Cost Branch Bound. 10M



OR

15. B). What are the different complexity classes? Outline each with an example. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Automata Theory and Compiler Design**
Course Code : **A412303**
Branch : **Information Technology**
Date & Session : **07-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define finite automata. 1 M
2. What is the relation between finite automata and regular expression? 1 M
3. What are the three ways to simplify a context free grammar? 1 M
4. What is the language generated by Context free grammar? 1 M
5. Define pushdown automata. 1 M
6. Name the programming techniques for Turing Machines. 1 M
7. Differentiate token, pattern and lexeme 1 M
8. Differentiate top down and bottom up parser. 1 M
9. Write three address code for the statement a=b*-c+b*-c. 1 M
10. What is stack allocation in compiler design? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain the procedure for converting NFA to DFA with suitable example. 10M

OR

11. B). Construct a DFA with reduced states equivalent to the regular expression (0+1)*(00+11)(0+1)* 10M

12. A). Construct the left most, rightmost and parse tree for the grammar 10M
S →aB/bA, A → aS/bAA/a, B → bS/aBB/b which accepts the string aaabbabbba

OR

12. B). What is meant by ambiguous grammar? Test whether the grammar is ambiguous or not? 10M
S → a/Sa/bSS/SSb/SbS.

13. A). Convert the following context free grammar to PDA 10M
S → 0A
A → 0ABC/ 1B/ 0
B → 1
C → 2

OR

13. B). Give formal definition of Turing Machine and explain the significance of movement of R/W head. 10M

(P.T.O.)

14. A). What are the phases of a compiler? Explain the phases in detail? Write down the output of each phase for the expression i:=i*70+j+2. 10M

OR

14. B). Construct SLR parsing table for the following grammar and check the input string a*b+a is acceptable or not 10M

E → E+T/T

T → TF/F

F → F*/a/b

15. A). Define intermediate code generator? Explain in brief different forms of intermediate code generation. 10M

OR

15. B). Explain different storage allocation strategies suitable examples. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Data Analytics**
Course Code : **A405420**
Branch : **Computer Science & Engineering**
Date & Session : **07-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. List various types of sources. 1 M
2. Define External Sources. 1 M
3. Define Hadoop. 1 M
4. How to handle Missing data? 1 M
5. What is Logistic Regression? 1 M
6. Define multinomial Logistic regression. 1 M
7. What is tree pruning? 1 M
8. Define Supervised learning. 1 M
9. What are the various plots in Data Analytics? 1 M
10. Define Data visualization. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Categorize the Impact of outliers on a dataset and treatment of Outliers with various methods. 10M

OR

11. B). Explain various steps involved in Data Preprocessing with neat diagram. 10M

12. A). Make use of Data Modeling Techniques in Data Analytics to organize the data. 10M

OR

12. B). Explain the process of replacing missing data with substituted values in imputations using various categories. 10M

13. A). Inspect linear regression using OLS approximation based on gauss markov theorem along with the example for linear regression using R. 10M

OR

13. B). Theme for the Model Building Life Cycle in Data Analytics. 10M

14. A). Utilize specific decision tree algorithms for tree building which helps to complete the process of working methodologies in an understandable way. 10M

OR

14. B). Explain the pruning techniques of CART accordingly with basis of approach. 10M

15. A). Classify the process of different Geometric Projection Visualization Techniques. 10M

OR

15. B). Contrast the concepts of Icon-Based Visualization Techniques. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Principles of Programming Languages**
Course Code : **A405403**
Branch : **Computer Science & Engineering**
Date & Session : **07-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define Virtual Machine. 1 M
2. List the principal phases of compilation. 1 M
3. What is the purpose of assignment statement? 1 M
4. What is aliasing? What are the problems associated with it? 1 M
5. Write an example of nested subprogram. 1 M
6. List the various design issues for functions. 1 M
7. List the features of semaphores. 1 M
8. Define Concurrency? 1 M
9. What are the features of FPL? 1 M
10. What is the type inferencing used in ML. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i. Construct the parse tree for the simple statement. 5M
A := B * (A + C) 5M
ii. Discuss ambiguous grammar.

OR

11. B). Describe the important factors influencing the writability of a language. 10M

12. A). i. Describe about the pointers in FORTRAN 90, Ada, pascal with an example. 5M
ii. Explain the different types of Union with an example. 5M

OR

12. B). i. Explain the unconditional statements with an example. 5M
ii. Explain about the control structures with an example. 5M

13. A). Write notes on Local Referencing Environments. 10M

OR

13. B). Give a detailed note on pass-by-name and pass-by-reference parameter passing methods. 10M

14. A). Write a note on Abstract Data Types in Ruby. 10M

OR

14. B). Explain the basic elements of prolog. 10M

15. A). i. Explain the different types of data types used in Python. 5M
ii. Explain about the internal representation of two LISP lists. 5M

OR

15. B). Write a LISP function Fib(n) that computes nth Fibonacci number. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Introduction to Data Science Using R**
Course Code : **A467304**
Branch : **CSD**
Date & Session : **07-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is Overfitting? 1 M
2. What is Datafication? 1 M
3. List different types of attributes. 1 M
4. How Mean, Median and Mode of central tendency are measured? 1 M
5. What are Ordered factors? 1 M
6. How do the merging of Lists happen? 1 M
7. List different Relational operators 1 M
8. Tell where can Nested functions used. 1 M
9. Show how bar chart can be draw by considering an example. 1 M
10. What is Multiple regression? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Interpret Statistical modeling of data science by considering any example. 10M

OR

11. B). List and explain Basic Data types in R and mention atleast two examples of each data type. 10M

12. A). Explain in detail about describing attributes by the number of values and write about Binary attribute. 10M

OR

12. B). Discuss about Range, Quartiles, Variance and Standard Deviation of measuring the dispersion of data. 10M

13. A). Apply sorting in Data frames by considering an example. 10M

OR

13. B). Show how Lists are converted to vectors? 10M

14. A). i) Compare Relational operators with Logical operators. 5M
ii) Write about Conditional statements. 5M

OR

14. B). Describe writing a function in R and about Nested functions in R. 10M

15. A). Describe Multiple Lines in graph Line graph and Scatter plot. 10M

OR

15. B). Apply Linear Regression Analysis for any data in the dataset and explain. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Cyber Crime Investigation & Digital Forensics**
Course Code : **A462305**
Branch : **CSC**
Date & Session : **07-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define Digital evidence. 1 M
2. Analysis the challenge aspect of digital evidence. 1 M
3. Categories digital investigation processing model. 1 M
4. Illustrated digital crime scene. 1 M
5. What is mean by violent crime? 1 M
6. Text for processing digital crime scene. 1 M
7. How to utilise computer basic in the digital forensics? 1 M
8. Compile the Unix system in digital evidence. 1 M
9. Important of basic network to digital investigation. 1 M
10. What is primary function of digital evidence in physical & data link layers? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Write the Important roles & responsible of the process of Digital Forensics in the today world. 10M

OR

11. B). Explain the different Digital Forensics Techniques. 10M

12. A). Brief the fundamental principles, surveying and preserving digital investigations. 10M

OR

12. B). Compare the various digital investigation models. 10M

13. A). Estimate the different roles and responsibilities of computer in violent crime 10M

OR

13. B). Explain how the digital evidence as Alibi working. 10M

14. A). Illustrate in brief about Digital evidence in Windows system. 10M

OR

14. B). How to applying Forensics science to computer environments with an example. 10M

15. A). Illustrate the working concept of digital evidence on physical layer and data link layers. 10M

OR

15. B). How to applying Forensics science to network with an example. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Deep Learning**
Course Code : **A466305/ A473304**
Branch : **CSM/ AIM**
Date & Session : **07-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. How to reduce Under-fitting problem? 1 M
2. Define Variance. 1 M
3. What is semi supervised leaning? 1 M
4. Define early stopping 1 M
5. Why padding is important in CNN? 1 M
6. Define Min Pool 1 M
7. Explain bi directional RNN. 1 M
8. Can we use RNN for any problem? Justify your answer. 1 M
9. List the applications of deep learning. 1 M
10. What are hyper parameters? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Briefly discuss about unsupervised learning algorithms. 10M

OR

11. B). What is a deep feedforward network, and how does it differ from a simple feedforward neural network? 10M

12. A). Explain the different types of regularization techniques used in deep learning, such as L1 and L2 regularization. How do they modify the loss function, and what are their individual advantages and disadvantages? 10M

OR

12. B). What is ensemble learning, and how does it improve the performance of machine learning models? Discuss the underlying principle of combining multiple models to achieve better results. 10M

13. A). What are the advantages of using CNNs over traditional fully connected neural networks for image processing tasks? Discuss with examples. 10M

OR

13. B). Explain the significance of hyper parameters like filter size, stride, and padding in a CNN. 10M

(P.T.O..)

14. A).	What are the key limitations of standard RNNs, particularly in terms of handling long-term dependencies?		10M
	OR		
14. B).	Describe the main challenges involved in training RNNs, such as vanishing and exploding gradients.		10M
15. A).	Explain about all performance metrics.		10M
	OR		
15. B).	List and explain applications of NLP.		10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Advanced Computer Architecture**
Course Code : **A412401**
Branch : **Information Technology**
Date & Session : **09-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	What is Parallel Computers?	1 M
2.	What is VLSI Model?	1 M
3.	Why do we need virtual memory in computer architecture?	1 M
4.	What is Superscalar Processor?	1 M
5.	Draw the Instruction Pipeline design.	1 M
6.	What is Non Linear Pipeline Processor?	1 M
7.	What is cache coherence?	1 M
8.	What is synchronization mechanism?	1 M
9.	What is compound vector processing?	1 M
10.	Define coarse-grained parallelism.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Discuss about the PRAM model.	5M
	ii) What are the conditions of parallelism? Explain.	5M
	OR	
11. B).	i) Explain About Interconnect Architectures.	5M
	ii) Briefly Discuss the following terms.	5M
	a) Multiprocessors b) Multicomputers	
12. A).	i) Explain about Vector Processor.	5M
	ii) Explain about Speedup performance laws.	5M
	OR	
12. B).	Briefly discuss about Performance metrics and Measures.	10M
13. A).	Explain about Shared Memory Organizations.	10M
	OR	
13. B).	Explain Weak Consistency Models in detail.	10M
14. A).	Explain in detail about Message –passing mechanisms.	10M
	OR	
14. B).	Explain generations of Multicomputers.	10M
15. A).	Explain About Compound vector processing.	10M
	OR	
15. B).	Explain SIMD Computer Organizations.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Advanced Python Programming**
Course Code : **A466402/ A473402**
Branch : **CSM/ AIM**
Date & Session : **09-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. List the principles of OOPs. 1 M
2. What are the operations performed on file? 1 M
3. How to create 1-d and 2-d arrays using numpy? 1 M
4. What is the use of the pandas module? 1 M
5. What is the use of the matplotlib module? 1 M
6. List any two methods in NLTK Library. 1 M
7. What is the purpose of GUI? Mention its advantages. 1 M
8. What is the use of the tkinter module? 1 M
9. List the methods used for fetching the results in mysql. 1 M
10. Define is Flask in python. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain in detail the concept of class and object with syntax and examples. 10M

OR

11. B). Develop a python program to create a file, write and read only parts of a file. 10M

12. A). i) Discuss about joining and splitting an array in numpy. 5M
ii) Explain about Series and DataFrame objects in pandas. 5M

OR

12. B). Explain in brief about types of data structres in pandas with example program. 10M

13. A). Write any 4 SciPy modules in details with example program each. 10M

OR

13. B). Explain the different ways of plotting graphs. 10M

14. A). Examine DDL and DML Operations with examples program. 10M

OR

14. B). Describe the steps to connect a python application to our database. 10M

15. A). What is QMainWindow class? Explain the graphical components present QMainWindow class with program. 10M

OR

15. B). Develop a Gul program to create an application for concurrency converter. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Full Stack Development**
Course Code : **A405312/ A467403**
Branch : **CSE/ CSD**
Date & Session : **09-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Write the basic web development framework. 1 M
2. What are the main functions of the Express components in Full Stack Development? 1 M
3. Explain how to open and close files in Node.js. 1 M
4. Differentiate between HTTP and HTTPS servers in Node.js. 1 M
5. Why is MongoDB considered a NoSQL database? 1 M
6. What is the role of MongoDB driver in Node.js? 1 M
7. What is the purpose of Express in web development? 1 M
8. What is the importance of data binding in Angular? 1 M
9. Why is React widely used for front-end development? 1 M
10. How is data passed between React components? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Describe in detail the different components of Full Stack Development (Node.js, MongoDB, Express, React, Angular). 10M

OR

11. B). Discuss the advantages and disadvantages of using JavaScript for both client and server-side development. 10M

12. A). Explain the use of JSON in Node.js and how it helps in data interchange with an examples. 10M

OR

12. B). Discuss the security features of HTTPS in Node.js and outline the steps for creating an HTTPS server. 10M

13. A). Describe the process of planning a data model in MongoDB and its impact on database structure. 10M

OR

13. B). Discuss the CRUD operations in MongoDB and provide examples of how they are implemented in a Node.js application. 10M

14. A). Explain the routing mechanism in Express with examples of defining routes and handling requests. 10M

OR

14. B). Discuss how Angular manages data flow and state across different components in an application. 10M

(P.T.O..)

15. A). Explain the concept of the Virtual DOM in React and how it optimizes rendering performance with a scenario. 10M

OR

15. B). Compare and contrast React with Angular their differences and use cases in Full Stack Development. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Cyber Laws**
Course Code : **A462404**
Branch : **CSC**
Date & Session : **09-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define cybercrime.	1 M
2.	What is the Information Technology Act, 2000?	1 M
3.	What are electronic records?	1 M
4.	Who are certifying authorities?	1 M
5.	List one key feature of the IT Act, 2000.	1 M
6.	Define cyber fraud.	1 M
7.	Define cloud computing.	1 M
8.	What does ICERT stand for?	1 M
9.	Define online harassment.	1 M
10.	When was the Criminal Law Amendment Act passed?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Analyze the importance of the National Policy on Information Technology 2012.	10M
	OR	
11. B).	Discuss History of cyber laws in India.	10M
12. A).	Explain about Digital signature and electronic signature.	10M
	OR	
12. B).	Explain the penalties and offenses listed in the IT Act.	10M
13. A).	Discuss about the electronic contract?	10M
	OR	
13. B).	Discuss about the cyber crimes.	10M
14. A).	Discuss the roles and responsibilities of the Department of Electronics and Information Technology.	10M
	OR	
14. B).	Explain the function of the Controller of Certifying Authorities (CCA).	10M
15. A).	Explain the procedure to report cybercrime in India.	10M
	OR	
15. B).	Describe the steps involved in reporting a case of cyberstalking.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Software Testing Methodologies**
Course Code : **A405406**
Branch : **Computer Science & Engineering**
Date & Session : **11-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	What do you mean by Coding bugs?	1 M
2.	What is achievable path?	1 M
3.	Define Ugly Domain.	1 M
4.	Define Domain closure.	1 M
5.	Give an example of a regular expression.	1 M
6.	Explain in-degree and out-degree.	1 M
7.	Define State Graph.	1 M
8.	What is the use of state table?	1 M
9.	What is idempotent?	1 M
10.	Which are asymmetric relations?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Explain the various software testing principles.	5M
	ii) Explain about the Taxonomy of bugs.	5M
	OR	
11. B).	i) How path selection can be done in path testing?	5M
	ii) What are link counters? Discuss their use in path testing.	5M
12. A).	i) Discuss in detail the data flow testing strategies.	5M
	ii) List out the Application of Data flow testing.	5M
	OR	
12. B).	Explain about Nice and Ugly domain.	10M
13. A).	What is path expression? Explain the path product and path sum.	10M
	OR	
13. B).	Construct Decision table for the given example. Rule1: "If the persons are male and over 30, then they shall receive a 15% raise. Rule 2: "If the persons are female, then they shall receive a 10% raise."	10M

(P.T.O..)

14. A). Write the design guide lines for building the finite state machine into code. 10M

OR

14. B). Demonstrate how an anomaly can be detected. Explain different types of data flow anomalies and data flow anomaly state graphs. 10M

15. A). Write about the power of matrix. Give any one example. 10M

OR

15. B). What is matrix of graph? How it was built? Explain Equivalence relations and partial ordering relations. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Data Mining**
Course Code : **A473409**
Branch : **AIM**
Date & Session : **11-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. List Data Mining Functionalities. 1 M
2. Why data pre-processing? 1 M
3. Define Frequent Item set Generation. 1 M
4. Define Multidimensional Associations. 1 M
5. Write short notes on Bayes Theorem. 1 M
6. List Advantages of Multi layer Feed Forward Neural Network 1 M
7. Why Clustering is called unsupervised learning technique. 1 M
8. List advantages of Hierarchical Clustering. 1 M
9. Define Spatial Mining. 1 M
10. List Key Challenges in Web Mining 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) What is Data Mining? How does it help in Knowledge Discovery? 5M
ii) Explain the procedure of measuring data similarity and dissimilarity. 5M

OR

11. B). i) Describe each of the Data Mining tasks with an example. 5M
ii) Demonstrate the different ways of handling missing values. 5M

12. A). Explain the process of generating frequent patterns using FP Growth algorithm for the following transaction data. Assume minimum support=3. 10M

T1	I1,I2,I3
T2	I2,I3,I4
T3	I4,I5
T4	I1,I2,I4
T5	I1,I2,I3,I5
T6	I1,I2,I3,I4

(P.T.O.)

OR

12. B). Illustrate the process of generating association rules using Apriori algorithm for the following data with minimum support=2 and minimum confidence=50% 10M

TID	ITEMSETS
T1	A, B
T2	B, D
T3	B, C
T4	A, B, D
T5	A, C
T6	B, C
T7	A, C
T8	A, B, C, E
T9	A, B, C

13. A). Determine the output class **'Default'** for the customer Andrew by applying KNN classifier where K=5. Write all the calculations in detail. 10M

Customer	Age	Loan	Default
John	25	40000	N
Smith	35	60000	N
Alex	45	80000	N
Jade	20	20000	N
Kate	35	120000	N
Mark	52	18000	N
Anil	23	95000	Y
Pat	40	62000	Y
George	60	100000	Y
Jim	48	220000	Y
Jack	33	150000	Y
Andrew	48	142000	?

OR

13. B). Briefly explain K-nearest-Neighbor classifiers with example. 10M

14. A). i) Outline the basic concept in cluster Analysis. 5M
ii) Discuss about Hierarchical methods. 5M

OR

14. B). i) Give Brief notes on DBSCAN algorithm. 5M
ii) Illustrate Types of Outliers and Challenges of Outlier Detection. 5M

15. A). What is web Mining and Explain Web Usage Mining? 10M

OR

15. B). Demonstrate Temporal Mining. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech V Semester Supplementary Examinations June/July-2025**
Course Name : **Scripting Languages**
Course Code : **A466410**
Branch : **CSM**
Date & Session : **11-07-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Compare and contrast the concepts of rails and false in Ruby. 1 M
2. What are the key features of Ruby? 1 M
3. List some commonly used class libraries in Ruby. 1 M
4. What are the three levels of method access control in Ruby? 1 M
5. What are the different primary data types in Perl? 1 M
6. How is 'PERL' defined in programming languages? 1 M
7. Why is the #! directive important in Perl scripts? 1 M
8. How does the eval function work in Perl? 1 M
9. Outline the differences between TCL and TK. 1 M
10. What are the different format flags available in TCL? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). How do you write a Ruby program to print 'Hello World', and what is the structure of the program? 10M

OR

11. B). Explain the various data types in Ruby, and how they can be demonstrated through examples. 10M

12. A). How does the Ruby Interpreter function, and what are the key options that can be utilized? 10M

OR

12. B). Explain the importance of garbage collection in Ruby on Rails. 10M

13. A). Explain control statements in Perl with a practical example. 10M

OR

13. B). What are the main advantages of utilizing scripting languages for various tasks? 10M

14. A). Explain the common security issues that exist in Perl. 10M

OR

14. B). Explain the concept of Dirty Hands Internet Programming. 10M

15. A). Explain the concept of strings in TCL and provide a script to check if a string is a palindrome. 10M

OR

15. B). Explain the different data structures in TCL and how event handling and binding work in TK. 10M

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