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**R18**

Course Code: A30514



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

**B.Tech V Semester Supplementary Examinations December-2024**

**Course Name: Computer Networks**

**(Common for CSE, IT, CSM, CSD & AID)**

**Date: 16.12.2024 AN**

**Time: 3 hours**

**Max.Marks: 70**

**(Note: Assume suitable data if necessary)**

**PART-A**

**Answer all TEN questions**

**Each question carries TWO marks.**

**10x2=20M**

1. What is the purpose of presentation layer in OSI model? 2 M
2. How do guided media differ from unguided media? 2 M
3. Outline the services provided by the Data link layer. 2 M
4. Define framing and the reason for its need. 2 M
5. What is DHCP snooping? 2 M
6. What is the use of multicast routing? 2 M
7. Differentiate between TCP and UDP. 2 M
8. Why is UDP pseudo header included in UDP checksum calculation? 2 M
9. What is the use of SNMP protocol in a network? 2 M
10. What is the difference between a user agent (UA) and a mail transfer agent (MTA)? 2 M

**PART-B**

**Answer the following. Each question carries TEN Marks.**

**5x10=50M**

- 11.A). Draw the OSI network architecture and explain the functionalities of every layer in detail. 10M

**OR**

11. B). Analyze the advantages of optical fiber over twisted pair and coaxial cable. 10M

12. A). Station A uses 32-byte packets to transmit messages to Station B using a sliding window protocol. The round-trip delay between A and B is 80 milliseconds and the bottleneck bandwidth on the path between a A and B is 128 kbps. What is the optimal window size that A should use? 10M

**OR**

12. B). Discuss stop and wait protocol for noisy and noiseless channels. 10M

13. A). Briefly explain the congestion control techniques to improve QoS. 10M

**OR**

13. B). Define routing & explain distance vector routing and link state routing 10M

14. A). Explain in detail about the three-way handshake protocol for connection establishment in TCP. 10M

**OR**

14. B). With a diagram explain about TCP connection management. 10M

15. A). Write short notes on: 10M

(i) IMAP

(ii) WWW

**OR**

15. B). Analyze in detail about DNS operation. 10M

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H.T No:

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**R18**

Course Code: A30518



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations December-2024

**Course Name: Formal Languages & Automata Theory**  
(Computer Science & Engineering)

Date: 18.12.2024 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions

Each question carries TWO marks.

10x2=20M

1. Define the terms alphabet, string, and language give examples. 2 M
2. Compare NFA & DFA. 2 M
3. Define regular expression with example. 2 M
4. Construct a regular grammar for  $L = \{0^n 11/n \geq 1\}$ . 2 M
5. Define ambiguity in CFG with an example. 2 M
6. Define Push Down Automata. 2 M
7. Define Chomsky Normal Form (CNF). 2 M
8. Define Turing machine. 2 M
9. Define Restricted Turing Machines. 2 M
10. Define undecidability. Give an example of undecidable problems. 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Design an NFA which accepts set of all strings which accepts strings ending with 00 and construct its equivalent DFA. 10M

**OR**

11. B). Construct the Moore machine to determine residue mod 3 and convert into Mealy machine. 10M

12. A). Show that  $L = \{0^n 1^n \mid n \geq 1\}$  is not regular. 10M

**OR**

12. B). i) Construct a DFA for the Regular expression  $(0+1)^* (00+11) (0+1)^*$ . 7M  
ii) Explain about the identity rules of Regular Expressions. 3M

13. A). Explain left most & right most derivations and parse trees with examples. 10M

**OR**

13. B). Construct the CFG for the PDA  $M = (\{q_0, q_1\}, \{0, 1\}, \{R, Z_0\}, \delta, q_0, Z_0, \Phi)$  and  $\delta$  is given 10M

by

$$\delta(q_0, 1, Z_0) = (q_0, RZ_0)$$

$$\delta(q_0, 1, R) = (q_0, RR)$$

$$\delta(q_0, 0, R) = (q_1, R)$$

$$\delta(q_1, 0, Z_0) = (q_0, Z_0)$$

$$\delta(q_0, \epsilon, Z_0) = (q_0, \epsilon)$$

$$\delta(q_1, 1, R) = (q_1, \epsilon).$$

(P.T.O)

14. A). i) Design a Turing Machine to accept the language  $L = \{wcw^R \mid w \in (a+b)^*\}$ . 5M  
ii) Define Chomsky Normal Form (CNF). Construct the following grammar to 5M  
CNF  $S \rightarrow 0S0 \mid 1S1 \mid 0 \mid 1$

**OR**

14. B). i) List out and discuss the closure properties of CFL. 5M  
ii) Construct CFG without  $\epsilon$  – production from the one which is given below 5M  
 $S \rightarrow a \mid Ab \mid aBa \quad A \rightarrow b \mid \epsilon \quad B \rightarrow b \mid A$

15. A). i) Explain about the undecidable problems about turing machines. 5M  
ii) Distinguish between class P and class NP Problems. 5M

**OR**

15. B). Explain the various variations of TM? How to achieve complex tasks using TM. 10M

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**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations December-2024

Course Name: **Information Security**

(CSE &amp; IT)

Date: 20.12.2024 AN

Time: 3 hours

Max.Marks:70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions

Each question carries TWO marks.

10x2=20M

1. What are the three main goals of Information Security? 2 M
2. List out various types of security attacks. 2 M
3. List three approaches to Message Authentication. 2 M
4. What are the principles of public key cryptosystems? 2 M
5. What is the function of TGS server in Kerberos? 2 M
6. Why does PGP generate a signature before applying compression? 2 M
7. What are the applications of IP Sec? 2 M
8. What are the services provided by the SSL Record Protocol for SSL Connections? 2 M
9. How does packet filtering firewall work? 2 M
10. What are the objectives of the intruder? 2 M

**PART-B**

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

- 11.A). i) Explain Block Cipher design principles. 5M  
ii) Define Output Feed Back Mode and list its advantages and disadvantages. 5M
- OR**
11. B). Explain DES algorithm with suitable example. Discuss its advantages and limitations. 10M
12. A). i) Discuss about RSA algorithm with example. 5M  
ii) Illustrate the procedure of key distribution in conventional encryption. 5M
- OR**
12. B). Describe the working principle of the SHA-512 algorithm in detail. 10M
13. A). i) Describe how authentication and confidentiality are handled in S/MIME. 5M  
ii) Describe the properties of digital signature. 5M
- OR**
13. B). How the messages are generated and transmitted in pretty good privacy (PGP) protocol? Explain with clear diagrams. 10M
14. A). i) Discuss Oakley key determination protocol. 5M  
ii) Discuss about Web Traffic Security Approaches. 5M
- OR**
14. B). i) Draw the IP security authentication header and Discuss the functions of each field. 5M  
ii) What are the key features of SET. 5M
15. A). i) List out four general techniques that firewall use to control access and enforce the site's security policy. 5M  
ii) Compare between Statistical anomaly detection and Rule-based detection. 5M
- OR**
15. B). i) Define VIRUS? and explain about types of Viruses. 5M  
ii) Describe Data Access Control Structures in Trusted systems. 5M

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**R18**

Course Code: A30529



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

**B.Tech V Semester Supplementary Examinations December-2024**

**Course Name: Software Testing Methodologies**

**(Common for CSE & IT)**

**Date: 20.12.2024 AN**

**Time: 3 hours**

**Max.Marks: 70**

**(Note: Assume suitable data if necessary)**

**PART-A**

**Answer all TEN questions**

**Each question carries TWO marks.**

**10x2=20M**

1. State pesticide paradox and complexity barrier in purpose of testing. 2 M
2. Explain about test design and different types of testing. 2 M
3. Differentiate between function and structure testing. 2 M
4. Explain the terms dicing, data flow and debugging. 2 M
5. Define program slice. 2 M
6. Discuss the advantages and disadvantages of path selection in transaction flow. 2 M
7. Define the bug assumptions for domain testing. 2 M
8. Define path expression and path product. 2 M
9. Define the operators of Boolean algebra. 2 M
10. Define transitions and discuss unreachable states. 2 M

**PART-B**

**Answer the following. Each question carries TEN Marks.**

**5x10=50M**

- 11.A). Explain goals for testing and model for testing in software testing. 10M
- OR**
11. B). Explain the factors on which the importance of the bugs depend and give the metrics for them. 10M
12. A). Discuss the following strategies of data flow testing with suitable examples: 10M
- i) All-Predicate-Uses (APU) strategy
  - ii) All-Computational (ACU) strategy.
- OR**
12. B). Define transaction flow structure. Discuss the reasons that the transaction flows are often structured. 10M
13. A). Define domains and paths. Explain domains and testability tips. 10M
- OR**
13. B). Explain about: 10M
- i) Interior point
  - ii) Boundary point
  - iii) Extreme point
  - iv) Cross term-step

**(P.T.O.)**

14. A). Demonstrate by means of truth tables the validity of the following theorems of Boolean algebra: 10M
- i) Associative laws
  - ii) Demorgan's theorems for three variables.

**OR**

14. B). Minimize the function using Karnaugh Map method: 10M
- $F(A, B, C, D) = P(1, 2, 3, 7, 9, 10, 11, 14) + Pd(6, 12)$

15. A). Discuss in detail about Graph matrices and its applications. 10M

**OR**

15. B). Demonstrate the steps involved in node reduction procedure. 10M

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**R18**

Course Code: A30516



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

**B.Tech V Semester Supplementary Examinations December-2024**

**Course Name: Operating Systems**

**(CSE & IT)**

**Date: 23.12.2024 AN**

**Time: 3 hours**

**Max.Marks:70**

**(Note: Assume suitable data if necessary)**

**PART-A**

**Answer all TEN questions**

**Each question carries TWO marks. 10x2=20M**

1. Define Operating System. 2 M
2. What is a System call? 2 M
3. Define a Thread. 2 M
4. What is the cooperation process? 2 M
5. Define Deadlock. 2 M
6. What is a Semaphore? 2 M
7. What is demand paging? 2 M
8. What is swapping? 2 M
9. Define File system. 2 M
10. What is the file access method? 2 M

**PART-B**

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

- 11.A). Explain about Operating systems structures. 10M
- OR**
11. B). i) Explain the different types of operating system 5M  
ii) Mention the objectives and functions of Real-Time Embedded systems. 5M
12. A). Explain about Priority scheduling algorithm give the non-preventive example. 10M
- OR**
12. B). What are the advantages of inter-process communication? How does communication take place in a shared-memory environment? Explain. 10M
13. A). What is a deadlock? Explain the banker's algorithm with example. 10M
- OR**
13. B). What is a Critical Section problem? Give the conditions that a solution to the critical section problem must satisfy. 10M
14. A). What is a page fault? Explain the steps involved in handling a page fault with a neat sketch? 10M
- OR**
14. B). Consider the following page reference string: 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6 How many page faults would occur for the optimal page replacement algorithm, assuming three frames and all frames are initially empty. 10M

**(P.T.O.)**

15. A). i) Write in detail about file attributes, operations and types and structures. 5M  
ii) Explain the various methods for free-space management. 5M

**OR**

15. B). i) Explain in detail about various ways of accessing disk storage. 5M  
ii) Explain the Indexed allocation of disk space. 5M

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**R18**

Course Code: A30530



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

**B.Tech V Semester Supplementary Examinations December-2024**

**Course Name: Artificial Intelligence**

**(Common for CSE & IT)**

**Date: 26.12.2024 AN**

**Time: 3 hours**

**Max.Marks: 70**

**(Note: Assume suitable data if necessary)**

**PART-A**

**Answer all TEN questions**

**Each question carries TWO marks.**

**10x2=20M**

1. Write about current trends in AI? 2 M
2. State the fundamental difference between BFS and DFS. 2 M
3. Define Pruning. 2 M
4. What is Knowledge based agents. 2 M
5. How Propositional logic is different than First Order Inference. 2 M
6. What is Mental Events? 2 M
7. Define Classical Planning. 2 M
8. What is Time and Schedule? 2 M
9. State Bayes theorem. 2 M
10. List down issues in Decision trees. 2 M

**PART-B**

**Answer the following. Each question carries TEN Marks.**

**5x10=50M**

- 11.A). Briefly Explain A\* algorithm in detail. 10M
- OR**
11. B). Define Heuristic search. What are the advantages of Heuristic search? 10M
12. A). Elaborate back tracking search for CSPs. 10M
- OR**
12. B). Explain Wumpus World with example. 10M
13. A). Discuss about Forward and Backward chaining in First Order Logic. 10M
- OR**
13. B). i) What is Ontological Engineering? 5M  
ii) Explain in detail the connectives used in propositional logic. 5M
14. A). Discuss hierarchical planning approach with an example. 10M
- OR**
14. B). Describe the differences and similarities between problem solving and planning. 10M
15. A). i) Illustrate the concept of Bayesian Networks. 5M  
ii) Explain the concept of Conditional Probability. 5M
15. B). Describe about Explanation based learning. 10M

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**R18**

Course Code: A30528



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

**B.Tech V Semester Supplementary Examinations December-2024**

**Course Name: Data Warehousing & Data Mining**

**(Common for CSE & CSM)**

Date: 30.12.2024 FN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions

Each question carries TWO marks.

10x2=20M

1. What is Data Warehousing? 2 M
2. Compare OLAP, ROLAP and HOLAP. 2 M
3. Summarize any three measures of Similarity. 2 M
4. Explain about subset selection. 2 M
5. Explain about Frequent Item Set 2 M
6. Interpret Associative rule mining two-step process. 2 M
7. Explain about types of classifier techniques. 2 M
8. Define Pre pruning and Post pruning. 2 M
9. Outline Strengths and Weakness of Hierarchical Clustering Algorithms. 2 M
10. Briefly explain about Outlier Detection. 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Demonstrate OLAP Operations in the Multidimensional Data Model with example. 10M

**OR**

11. B). Compare and contrast operational Database Systems and Warehouses. 10M

12. A). Explain about KDD process in Data Mining. 10M

**OR**

12. B). Explain the significance of Dimensionality Reduction. 10M

13. A). Given are the following five transactions on items {A,B,C,D,E}: 10M

tid	Items
1	{A,B}
2	{A,B,D}
3	{B,D,E}
4	{B,C,D,E}
5	{A,B,C}

Apply Apriori algorithm to compute all frequent itemsets, and their support with minimum support 2.

**OR**

13. B). Demonstrate FP growth algorithm. 10M

(P.T.O..)

14. A). Explain why the Naive Bayes Classifier often performs quite well (in terms of the error-rate on a test sample), even when its independence assumption is not satisfied. 10M

**OR**

14. B). Explain about K-Nearest neighbor classification algorithm with an example. 10M

15. A). Explain K-means clustering algorithm. What are its limitations? 10M

**OR**

15. B). Explain about Agglomerative Hierarchical clustering algorithm with an example. 10M

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