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R18

Course Code: A30516



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: OPERATING SYSTEMS

(Common for CSD, AID & AIM)

Date: 20.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Do time sharing differ from Multiprogramming? if so, how? 2 M
2. What is turnaround time? 2 M
3. What is Semaphore? 2 M
4. Write the four situations under which CPU Scheduling decisions take place. 2 M
5. State the four necessary condition for a deadlock situation to arise. 2 M
6. Write short notes on message queues. 2 M
7. Define Virtual Memory. 2 M
8. Give an example of a situation where variable-size records would be useful. 2 M
9. List the attributes of a file. 2 M
10. Which disk scheduling algorithm would be best to optimize the performance of a RAM disk? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain the important services of an operating system. 10M
- OR**
11. B). Discuss in detail the concept of virtual machines and types of system calls. 10M
12. A). Explain in detail about any two CPU scheduling algorithms with suitable examples. 10M
- OR**
12. B). Explain the differences in the degree to which FCFS, RR and Non-preemptive SJF scheduling algorithms, discriminate in favor of short process. 10M
13. A). i) What is a deadlock? What are the necessary conditions for a deadlock to occur? 5M
ii) How can a system recover from deadlock? 5M
- OR**
13. B). What is meant by critical section problem? What are the solutions for critical section problems? 10M
14. A). Explain the concept of paging in detail with necessary diagrams. 10M
- OR**
14. B). Explain the principles of segmented and paged implementation of memory with a diagram. 10M
15. A). Discuss the different file allocation methods with suitable example. 10M
- OR**
15. B). Write a detailed notes on various file access methods. 10M



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: DESIGN & ANALYSIS OF ALGORITHMS
(Common for CSC & CSD)

Date: 22.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Define the terms: i) Profiling ii) Space Complexity. 2 M
2. What are the Characteristics of an Algorithm? 2 M
3. What is the constraint and objective function of knapsack problem? 2 M
4. Distinguish dynamic programming and Divide and Conquer. 2 M
5. Define Bounding Function. 2 M
6. What is Chromatic number and give the state space tree for 4 – coloring problem? 2 M
7. Define spanning tree. 2 M
8. State Pre-ordered traversal of a tree. 2 M
9. Define Cook's Theorem. 2 M
10. Define Exponential Time. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) What is Time complexity of an algorithm? How to estimate time complexity using frequency count method. 5M
- ii) Solve the following recurrence relation: 5M
- $$T(n) = \begin{cases} a, & \text{if } n = 1 \\ 2T\left(\frac{n}{2}\right) + C_n & \text{if } n > 1 \text{ where } a \text{ and } c \text{ are constants.} \end{cases}$$

OR

- 11.B). Write the algorithm for matrix multiplication and find the time complexity of the algorithm using step-count method. 10M
- 12.A). i) Explain the structure of Divide and Conquer algorithms. 3M
- ii) Write and explain Strassen's Matrix Multiplication algorithm. 7M

OR

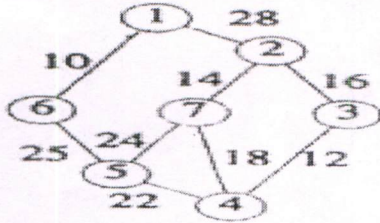
- 12.B). i) Describe an algorithm for optimal solution of TSP using dynamic programming. 5M
- ii) Solve the following job sequencing problem: 5M
- $n=5$, $(p_1, \dots, p_5)=(30, 45, 20, 15, 10)$ and $(d_1, \dots, d_5)=(2, 2, 1, 3, 3)$.
- 13.A). i) Outline N-Queens problem and solve 8-Queens problem using backtracking. 5M
- ii) What is a Hamiltonian Cycle? Explain how to find Hamiltonian path and cycle using backtracking algorithm? 5M

(P.T.O..)

OR

13. B). Explain the FIFO BB 0/1 Knapsack problem procedure with the knapsack instance for $n=4$, $m=15$, $(p_1, p_2, p_3, p_4) = (10, 10, 12, 18)$, $(w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$. Draw the portion of the state space tree and find optimal solution. 10M

14. A). Find the minimum cost spanning tree for the given problem step by step using prim's Algorithms. 10M



OR

14. B). Explain the traversal of a graph using DFS and BFS. 10M

15. A). i) Explain NP-complete and NP-Hard classes and differentiate between them with suitable examples. 5M

ii) Explain the satisfiability problem and write the algorithm for the same. 5M

OR

15. B). i) Explain NP-hard and NP-complete classes with examples. 5M

ii) Explain about min-max search problem. 5M

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Course Code: A36701



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: STATISTICAL FOUNDATIONS OF DATA SCIENCE

(CSD)

Date: 24.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Compute the mean, trimmed mean, and median for the first 10 natural numbers. 2 M
2. Explain about the histogram and density plots. 2 M
3. If the probability of a click converting to a sale is 0.02, what is the binomial probability of observing 0 sales in 200 clicks? 2 M
4. Write the formula for normal distribution and explain. 2 M
5. Define ANOVA. 2 M
6. Define Power & Sample size. 2 M
7. Define predictions and prediction errors. 2 M
8. Write about RMSE and RSE. 2 M
9. Define dummy variables. 2 M
10. Define Outliers. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain in detail about the correlation and its properties. 10M
- OR**
11. B). i) Differentiate between rectangular data and non-rectangular data. 3M
ii) Explain various measures of central tendency. 7M
12. A). i) How do you estimate the failure rate in Lambda in Poisson distribution? 3M
ii) Explain various sampling techniques. 7M
- OR**
12. B). Explain in detail about the basic assumption of Binominal Distribution. 10M
13. A). i) Explain central limit theorem. 6M
ii) Explain the relevance of fisher's exact test in Data Science. 4M
- OR**
13. B). Explain in detail about one-way & two-way hypothesis test. 10M

(P.T.O..)

14. A). i) Explain in detail about Stepwise regression. 3M
ii) Explain regression line fitting using OLS method. 7M

OR

14. B). Write and explain the algorithm for basic k-fold cross-validation with example. 10M

15. A). Explain in detail about the interpreting the Regression equation by correlated predictors. 10M

OR

15. B). What is Heteroskedasticity and is useful in Regression Diagnostics in detail? 10M

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Course Code: A30509



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: DATABASE MANAGEMENT SYSTEMS

(Common for CSE, IT, CSC, CSD & AID)

Date: 01.03.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. How to represent the strong entity set and weak entity set in E-R Model? 2 M
2. What are the limitations and goals of DBMS? 2 M
3. Define the terms: Relational Databases, Tables 2 M
4. Explain Integrity constraints over relations. 2 M
5. What do you mean by Normalization and note it's need? 2 M
6. Define Fifth Normal Form. 2 M
7. What is Multiple Granularity? 2 M
8. What do you mean by Locking protocol? 2 M
9. Differentiate Indexing and Hashing. 2 M
10. Discuss about Primary Indexes. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) Explain Conceptual design with E-R model. 5M
ii) Explain in detail about DDL and DML with an example. 5M

OR

- 11.B). List the Merits and Demerits of E-R model? Draw an E-R Diagram for any Banking Enterprise System. 10M

- 12.A). Explain the following Operators in SQL with examples: i) SOME, ii) IN, iii) EXCEPT, iv) EXISTS and v) UNION. 10M

OR

- 12.B). What are Integrity constraints? Define the terms Primary key constraints and Foreign key constraints. How are these expressed in SQL. 10M

- 13.A). Explain in detail about 2NF, 3NF and BCNF with example. 10M

OR

- 13.B). Explain Tuple Relational Calculus and Domain Relational Calculus with suitable examples. 10M

(P.T.O..)

14. A). i) Define Transaction? Explain ACID properties. 5M
ii) Give an overview of Timestamp Based Protocol. 5M

OR

14. B). Explain the concept of Serializability and Recoverability with example. 10M

15. A). Explain Hash Based Indexing and Tree Based Indexing with example. 10M

OR

15. B). Explain in detail about Indexed Sequential Access Methods. 10M

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Course Code: A30557



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: WEB PROGRAMMING

(Common for CSD, AID & AIM)

Date: 03.03.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Write the structure of HTML Program. 2 M
2. What are the different types of lists in HTML? 2 M
3. What is external style sheet? 2 M
4. Apply color property red to <H1> tag using internal style of CSS? 2 M
5. What is JavaScript? What are the features of JavaScript? 2 M
6. What is DATE object in Java script? 2 M
7. Define XML Schema. 2 M
8. Define XML. What are the advantages of XML? 2 M
9. What is synchronous request in AJAX? 2 M
10. List any two advantages and disadvantages of AJAX. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Construct a HTML Document for Bank Registration Page. 10M

OR

11. B). Design the static web page that display a marks table with three rows and four columns as shown below: 10M

Marks1	Marks2	Marks3	Total
55	66	87	208
96	85	88	269

12. A). What are the advantages of using CSS and Explain How to include CSS in the webpage? 10M

OR

12. B). List and explain the Font and Text element properties and values used CSS. 10M

13. A). List and explain in detail about various java script objects? 10M

OR

13. B). Write a java script to validate a form consisting of a hall ticket number as username and mobile number as password. Also navigate to another web page after validation. 10M

(P.T.O..)

14. A). Explain the various types of XML schema data types and their applications. 10M

OR

14. B). What is DOM? Draw the detailed DOM objects structure. Explain its usage. 10M

15. A). Explain about AJAX Web Application Model with Example. 10M

OR

15. B). What is Ajax? Explain with an example, how is Ajax different form traditional web applications. 10M
