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R18

Course Code: A30516



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations February-2024

Course Name: **OPERATING SYSTEMS**

(Common for CSD, AID & AIM)

Date: 05.02.2024 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 Operating System and list the objectives of Operating System. 2 M
2. What does the CPU do when there are no user programs to run? 2 M
3. List out the data fields associated with process control blocks. 2 M
4. What are the various states of a process and draw a diagram? 2 M
5. Outline the requirements that a critical section solution should satisfy. 2 M
6. What is Inter Process Communication? List out the calls involved in it. 2 M
7. Define Virtual Memory. 2 M
8. What are logical and physical addresses? 2 M
9. What is the role of file organization module in file system architecture? 2 M
10. List the attributes of a file. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain the purpose and importance of system calls in detail with examples. 10M
- OR**
11. B). Classify the types of system calls and explain any three types of it with its functions. 10M
12. A). Discuss how scheduling algorithms are selected for a system. What are the criteria considered? 10M
- OR**
12. B). Show how cooperating process can communicate each other via a message passing facility with an example. 10M
13. A). i) Explain Mutual Exclusion using semaphores. 5M
ii) Interpret Dining philosopher problem with an example. 5M
- OR**
13. B). How does deadlock can be avoided using banker's algorithm? 10M
14. A). Discuss the performance of demand paging. Illustrate the steps involved in handling a page fault 10M
- OR**
14. B). Explain any two page replacement algorithms. 10M
15. A). Explain how file management is done in Linux. 10M
- OR**
15. B). i) Explain about the free space management. 5M
ii) Explain in detail about the file allocation methods in operating system. 5M

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Course Code: A30511



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations February-2024

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

Date: 07.02.2024 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 omega notation. 2 M
2. Define Time Complexity and space complexity. 2 M
3. What is the time complexity of Strassen's matrix multiplication? 2 M
4. What is knapsack problem? 2 M
5. Define dynamic programming. 2 M
6. What is graph coloring? 2 M
7. Define topological sorting. 2 M
8. How to compute transitive closure? 2 M
9. Define non deterministic algorithms. 2 M
10. Define lower bounds through reduction. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

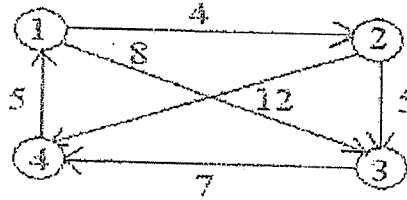
5x10=50M

- 11.A). Explain the characteristics of an algorithm with suitable example. 10M
- OR**
11. B). i) Explain about asymptotic notations in detail. 5M
ii) Evaluate the Big-Oh Notation, Little-Oh Notation and Theta notation for $f(n)=2n^2+10n+100$ 5M
12. A). Show that Merge sort is implemented by Divide and conquer method. 10M
- OR**
12. B). Construct Optimal Binary Search Tree(OBST) for the following elements $n=4$, $(a_1,a_2,a_3,a_4)=(do, if, int, while)$, $(p_1,p_2,p_3,p_4)=(3,3,1,1)$ and $(q_0,q_1,q_2,q_3,q_4)=(2,3,1,1,1)$ 10M
13. A). Explain Travelling Salesman problem with Branch and Bound method. 10M
- OR**
13. B). Apply sum of subsets problem with $W=\{5,7,10, 12,15,18,20\}$ and $M=35$ and also draw the portion of the state space that is generated. 10M

(P.T.O.)

14. A). Obtain all pair shortest path for the following graph.

10M



OR

14. B). What is minimum cost spanning tree? Explain Kruskal's method with an example.

10M

15. A). What is meant by computability of Algorithms? What are different computable classes? Explain.

10M

OR

15. B). Write short notes on disjoint set problem in lower bounds through reduction.

10M

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Course Code: A36701



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations February-2024

Course Name: STATISTICAL FOUNDATIONS OF DATA SCIENCE
(CSD)

Date: 09.02.2024 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. Explain about the probability and expected value. 2 M
2. Define structured data. 2 M
3. Illustrate the long-tailed nature of data is stock returns. 2 M
4. Compare the difference between Standard Deviation Versus Standard Error. 2 M
5. Define the term outlier. 2 M
6. A/B Testing two web headlines to determine which produces more clicks. 2 M
7. Define Method of Least square. 2 M
8. Construct regression equations on X on Y & Y on X. 2 M
9. Define Partial Residual Plots. 2 M
10. Difference between Correlated variables and Confounding variables. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What are the various measures of variability and which measure is more frequently used? 10M
- OR**
11. B). Differentiate between categorical data and numerical data. 10M
12. A). Explain normal distribution of data. 10M
- OR**
12. B). Explain various measures of central tendency. 10M
13. A). Explain in detail about the Null Hypothesis and Alternative Hypothesis. 10M
- OR**
13. B). Demonstrate the assumptions of ANOVA test and Explain ANOVA one-way classification. 10M
14. A). Explain in detail about RSS and OLS with example. 10M
- OR**
14. B). Obtain about the Confidence and Prediction intervals with detail example. 10M
15. A). Differentiate between Influential Values and standardized residual with example. 10M
- OR**
15. B). Explain regression equation with suitable example. 10M

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Course Code: A30509



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations February-2024

Course Name: DATABASE MANAGEMENT SYSTEMS

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

Date: 14.02.2024 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. What is DBMS? What are the advantages of DBMS. 2 M
2. How to represent the strong entity set and weak entity set in ER-Model? 2 M
3. Define the terms: Relational Databases, Tables. 2 M
4. Define the form of basic SQL query. 2 M
5. List the primitive operators in Relational algebra. 2 M
6. What is schema refinement. 2 M
7. Define Serializability. 2 M
8. What is the motivation for concurrent execution? 2 M
9. What is an index? Give an example. 2 M
10. Define un clustered index. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain conceptual design with E-R model and Draw an E-R Diagram that illustrates the Banking System. 10M

OR

11. B). Explain the architecture of DBMS with a neat diagram and note its scope. 10M

12. A). What is a relation? Differentiate between a relation schema and relation instance? What are domain constraints, Discuss. 10M

OR

12. B). Illustrate the Set comparison operators and Aggregation operators with example. 10M

13. A). i) Discuss in detail about the operations of relation algebra with example. 5M
ii) Compare Super key, Candidate key, Primary Key for a relation with example. 5M

OR

13. B). What is redundancy? Explain the problems caused by redundancy with suitable example. 10M

14. A). i)What is Transaction? Explain the properties of Transaction. 5M
ii) Give an overview of Validation Based Protocol. 5M

OR

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

15. A). State and explain various file organization methods. Give suitable examples to each of them. 10M

OR

15. B). Explain about indexed sequential access methods in detail. 10M
