

Hall Ticket Number :									
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R-20

Code: 20DF21T

M.C.A. II Semester Regular & Supplementary Examinations Aug/Sept 2023

Operating Systems

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
UNIT-I				
1.	a) Under what circumstances would a user be better off using a timesharing system rather than a PC or a single-user workstation?	6M	1	1
	b) What is the purpose of the command interpreter? Why is it usually separate from the kernel?	6M	1	2
OR				
2.	a) Distinguish between the client-server and peer-to-peer models of distributed systems.	6M	2	2
	b) What are the five major activities of an operating system with regard to file management? Give brief description.	6M	2	1
UNIT-II				
3.	Why we semaphore? Discuss, how can we implement by using wait and signal for providing process synchronization?	12M	2	2
OR				
4.	With the help of suitable example, explain the working of shortest job first scheduling algorithm.	12M	2	4
UNIT-III				
5.	What is the optimistic assumption made in the deadlock-detection algorithm? How can this assumption be violated?	12M	3	2
OR				
6.	Consider the deadlock situation that can occur in the dining philosophers problem when the philosophers obtain the chopsticks one at a time. Discuss how the four necessary conditions for deadlock hold in this setting.	12M	3	3
UNIT-IV				
7.	a) Explain why sharing a reentrant module is easier when segmentation is used than when pure paging is used.	6M	4	2
	b) What is the purpose of paging the page tables?	6M	4	2
OR				
8.	In some systems, a subdirectory can be read and written by an authorized user, just as ordinary files can be. a) Describe the protection problems that could arise. b) Suggest a scheme for dealing with each of these protection problems.	12M	4	2
UNIT-V				
9.	The access-control matrix can be used to determine whether a process can switch from, say, domain A to domain B and enjoy the access privileges of domain B. Is this approach equivalent to including the access privileges of domain B in those of domain A? Explain.	12M	5	1
OR				
10.	Discuss in detail about the security issues and threats.	12M	5	3

*****All the Best*****

Hall Ticket Number :										
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R-20

Code: 20DF22T

M.C.A. II Semester Regular & Supplementary Examinations Aug/Sept 2023

Python Programming

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT-I

- 1. a) List and explain few most commonly used built-in types in python. 6M 1 1,3
- b) Does python support multiple assignment? Justify your answer. 6M 1 1,3

OR

- 2. a) Write a python program to create variables in terms of integer, float and string 6M 1 1,3
- b) Write a python code to demonstrate type conversions using int(), float(), and str(). 6M 1 1,3

UNIT-II

- 3. a) How does try-except statement work? Demonstrate with an example python code. 6M 1 1,3
- b) Illustrate the concept of importing module attributes in python scripts. 6M 1 1,3

OR

- 4. a) List out the control flows and explain. 6M 1 1,3
- b) What are the different types of operators used to evaluate Boolean expression? 6M 1 1,3

UNIT-III

- 5. a) What type of parameter passing is used in Python? Justify your answer with sample programs. 6M 2 2,3
- b) Read a string from the user and redisplay the same string after removing vowels from it without using built-in function. Write a Python program to illustrate it.
Input: "INDIA"
Output: "ND" 6M 2 2,3

OR

- 6. Write a neat notes on Objects in python with suitable examples 12M 2 2,3

UNIT-IV

- 7. a) Describe the different access modes of the files with an example. 6M 3 3
- b) Discuss the following methods associated with the file object
a) read() b) readline() c) readlines() d) tell() e) seek() f) write() 6M 3 3

OR

- 8. a) Develop a python program to access the elements of a Nested dictionary 6M 3 3
- b) Define exception and how to handle exceptions in python programming? 6M 3 3

UNIT-V

- 9. a) What is a recursive function? Explain different types of arguments used in user defined functions. 6M 1 1,3
- b) Differentiate iteration and recursion with a simple python program 6M 1 1,3

OR

- 10. a) Discuss inheritance in Python programming language. Write a Python program to demonstrate the use of super() function. 6M 5 2,3
- b) Program to demonstrate the Overriding of the Base Class method in the Derived Class. 6M 5 2,3

*****All the Best*****

Hall Ticket Number :										
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R-20

Code: 20DF23T

M.C.A. II Semester Regular & Supplementary Examinations August 2023

Software Engineering

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

	Marks	CO	BL
UNIT-I			
1. a) Classify the Software Engineering Layered Architecture.	8M	1	L5
b) Describe the use of concurrent development model (or) concurrent engineering model?	4M	1	L3
OR			
2. Elaborate various CMMI levels with Specific Goals & Practices?	12M	1	L4
UNIT-II			
3. a) Describe Waterfall Model with an example	4M	2	L2
b) Illustrate in detail the Requirements Document Structure with suitable examples?	8M	2	L4
OR			
4. a) Write a short note on Behavioral models	4M	2	L2
b) Consider how requirements are managed in software project management with suitable examples	8M	2	L5
UNIT-III			
5. Briefly discuss about the following fundamental concepts of software design: i) Abstraction ii) Modularity iii) Information hiding iv) Functional Independence	12M	3	L3
OR			
6. a) Justify the Design Concepts in Software Engineering	6M	3	L4
b) Give explanation on the concept of Modular Decomposition Styles	6M	3	L4
UNIT-IV			
7. a) Write a note on Software Inspections.	4M	4	L2
b) Illustrate briefly Equivalence Partitioning and Boundary Value Analysis in Black Box Testing	8M	4	L5
OR			
8. Describe the following. i) alpha, ii) beta testing, iii) stress testing, iv) integration test v) Unit Testing vi) Component Testing	12M	4	L3
UNIT-V			
9. Examine the steps in Identifying the Risk, List out the Software Risks.	12M	5	L5
OR			
10. a) Importance of the concept of Software Productivity with suitable examples	8M	5	L4
b) Define the Management activities?	4M	5	L2

*****All the Best*****

Hall Ticket Number :

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R-20

Code: 20DF24T

M.C.A. II Semester Regular & Supplementary Examinations Aug/Sept 2023

Computer Networks

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT-I

1. Describe functions of various layers of OSI reference model with a neat diagram 12M CO1 L1

OR

2. Identify the applications of Frequency Division Multiplexing and Code Division Multiplexing. 12M CO1 L1

UNIT-II

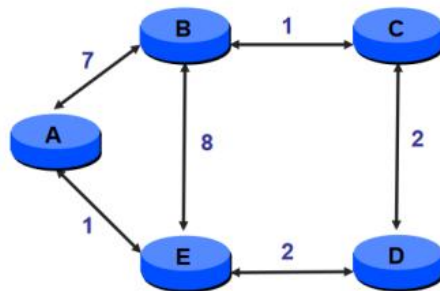
3. Summarize the working mechanism of Go-Back-N ARQ and Selective Repeat ARQ for same the scenario with suitable diagrams. 12M CO2 L2

OR

4. Discuss the available wireless local area network protocols with the importance over others in the same category. 12M CO2 L2

UNIT-III

5. The network is shown in the figure below. Apply Bellman-Ford algorithm on the network shown in the figure to construct a path from node A to all other nodes.



12M CO3 L3

OR

6. Illustrate the role of internetworking computer networks with proper diagrams. 12M CO3 L3

UNIT-IV

7. Summarize the components of User Datagram Protocol (UDP) header. Explain the significance of each component in detail with UDP header format. 12M CO4 L5

OR

8. Conclude the role of Components of E-Mail System with the set of services provided by the E-Mail System. 12M CO4 L5

UNIT-V

9. Analyze the process of creation and working mechanism of digital signature with an example. 12M CO5 L4

OR

10. Infer the word "Entity Authentication." How it is related to computer networks in a real world scenario. 12M CO5 L4

*** All the Best ***

Hall Ticket Number :

R-20

Code: 20DF2GT

M.C.A. II Semester Regular & Supplementary Examinations Aug/Sept 2023

Design and Analysis of Algorithms

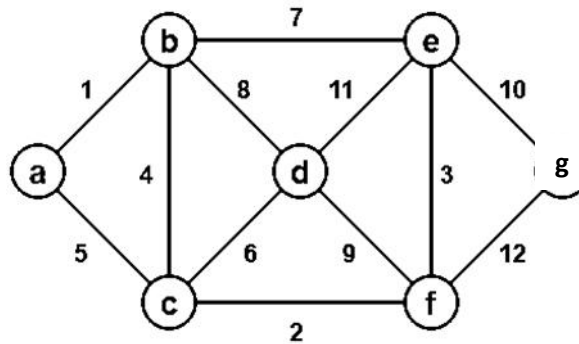
Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

	Marks	CO	BL
UNIT-I			
1. a) Describe different notations used to represent time complexities.	6M	1	3
b) Write an algorithm using recursion that determines the GCD of two numbers.	6M	1	2
OR			
2. a) Create an algorithm using the recursive function to find the sum of n numbers	6M	1	2
b) Solve the recurrence relation $T(n) = 2T\left(\frac{n}{2}\right) + n$, if $T(1) = 1$ and prove that $T(n) = O(n \log n)$.	6M	1	4
UNIT-II			
3. a) Give the general procedure of the divide and conquer method.	4M	2	2
b) Apply a quick sort algorithm to sort the list. E, X, A, M, P, L, E in alphabetical order, and write the best- and worst-case quicksort time complexity.	8M	2	3
OR			
4. a) Describe the merge sort algorithm and its working strategy for the following data: 43, 32, 22, 78, 63, 57, 91, and 13.	7M	2	3
b) What is a binary tree traversal and its properties?	5M	2	2
UNIT-III			
5. a) Construct the optimal binary search tree for n=4 identifiers (a1, a2, a3, a4)=(do, if, int, while) P(1:4)=(3,3,1,1) and Q(0:4)=(2,3,1,1,1).	8M	3	4
b) Write the difference between Prim's and Kruskal's approaches to obtain a minimum spanning tree.	4M	3	2
OR			
6. a) Consider the knapsack instance n = 3, (w1, w2, w3) = (2, 3, 4), (P1, P2, P3) = (1, 2, 5) and M = 6. Find the optimal solution using dynamic programming.	6M	3	3

- b) Discuss the design steps in Prim's algorithm to construct a minimum spanning tree with the following graph.



6M 3 3

UNIT-IV

7. a) Elaborate on how the backtracking technique can be used to solve the n-queens problem and write its state space tree.

10M 4 3

- b) Define graph coloring.

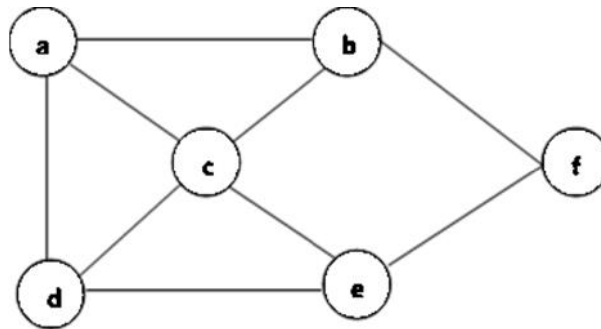
2M 4 1

OR

8. a) Discuss the general method of branch and bound technique.

6M 4 2

- b) Draw the state space representation of the Hamiltonian cycle in the following undirected graph.



6M 4 3

UNIT-V

9. a) Compare NP-complete and NP-hard problems.

6M 5 2

- b) Explain Non-Deterministic search and sorting algorithms.

6M 5 3

OR

10. a) Discuss the approximation algorithms for NP-hard problems.

8M 5 3

- b) Define NP-hard and list out any two properties of NP-problems.

4M 5 2

END

Hall Ticket Number :

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R-20

Code: 20DF2ET

M.C.A. II Semester Regular & Supplementary Examinations Aug/Sept 2023

Management Information Systems

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- | | Marks | CO | BL |
|---|-------|----|----|
| 1. a) Define MIS. Explain the role and impact of the Management information system. | 6M | 1 | 2 |
| b) How a MIS is typically organized within a company? Discuss. | 6M | 1 | 3 |

OR

- | | | | |
|---|----|---|---|
| 2. a) How do Decision Support Systems differ from Management Information Systems? | 6M | 1 | 3 |
| b) What is the importance of studying management and organizational behavior? | 6M | 1 | 2 |

UNIT-II

- | | | | |
|---|----|---|---|
| 3. a) Describe about Dimensions of information systems. | 6M | 2 | 3 |
| b) Discuss how to use Information Systems to achieve competitive advantage. | 6M | 2 | 3 |

OR

- | | | | |
|---|----|---|---|
| 4. a) Explain about determination of information sources. | 6M | 2 | 3 |
| b) Discuss how information systems impact business firms. | 6M | 2 | 3 |

UNIT-III

- | | | | |
|---|----|---|---|
| 5. a) What were the key milestones or stages in the evolution of the information system? | 6M | 3 | 2 |
| b) What limitations or constraints need to be considered during the conceptual system design process? | 6M | 3 | 2 |

OR

- | | | | |
|--|----|---|---|
| 6. a) What specific challenges or complexities were involved in the decision-making process? | 6M | 3 | 2 |
| b) What specific details and information should be included in the system concept documentation? | 6M | 3 | 3 |

UNIT-IV

- | | | | |
|--|----|---|---|
| 7. a) How will you identify and evaluate potential trade-offs between different design options? | 6M | 4 | 3 |
| b) What factors or considerations will be made when deciding the appropriate degree of automation? | 6M | 4 | 2 |

OR

- | | | | |
|--|----|---|---|
| 8. a) What specific outcomes or deliverables are expected from the detailed design phase? | 6M | 4 | 2 |
| b) How will you assess and determine the level of automation required for each operation within the MIS? | 6M | 4 | 3 |

UNIT-V

- | | | | |
|--|----|---|---|
| 9. a) How will you develop a detailed project plan for implementation phase? | 6M | 5 | 4 |
| b) What criteria and metrics will you use to evaluate the effectiveness and efficiency of the MIS? | 6M | 5 | 3 |

OR

- | | | | |
|--|----|---|---|
| 10. a) How do you plan to define system workflows and document processes and procedures for the MIS? | 6M | 5 | 4 |
| b) What support will be provided to users during and after the cut-over process? | 6M | 5 | 3 |

*****All the Best*****