

Hall Ticket Number :											
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R-20

Code: 20DF21T

M.C.A. II Semester Supplementary Examinations Jan/Feb 2024

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) What is an operating system? List and explain the functions of it. | 6M | CO1 | 2 |
| | b) With the help of a neat diagram, explain the General structure of a clustered system | 6M | CO1 | 1 |

OR

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|----|-------------------------------------------------------------------|-----|-----|---|
| 2. | Give brief description about the different types of system calls. | 12M | CO1 | 1 |
|----|-------------------------------------------------------------------|-----|-----|---|

UNIT-II

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|----|------------------------------------------------------------------|----|-----|---|
| 3. | a) Distinguish between preemptive and non-preemptive scheduling. | 6M | CO2 | 2 |
| | b) Write short notes on round robin scheduling algorithm. | 6M | CO2 | 2 |

OR

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|----|--------------------------------------------------------------|-----|-----|---|
| 4. | Present a solution to the dining-philosopher using monitors. | 12M | CO2 | 3 |
|----|--------------------------------------------------------------|-----|-----|---|

UNIT-III

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|----|--------------------------------------------------------------------------|-----|-----|---|
| 5. | What is a deadlock? When it arises? How can we avoid deadlocks? Explain. | 12M | CO3 | 5 |
|----|--------------------------------------------------------------------------|-----|-----|---|

OR

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|----|-----------------------------------------------------------------------------------------|-----|-----|---|
| 6. | Is it possible to have a deadlock involving only a single process? Explain your answer. | 12M | CO3 | 3 |
|----|-----------------------------------------------------------------------------------------|-----|-----|---|

UNIT-IV

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|----|------------------------------------------------------------------------|----|-----|---|
| 7. | a) Explain the difference between internal and external fragmentation | 6M | CO4 | 2 |
| | b) Why are segmentation and paging sometimes combined into one scheme? | 6M | CO4 | 1 |

OR

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|----|-----------------------------------------------------------------------------------------------------|----|-----|---|
| 8. | a) What are the advantages and disadvantages of providing mandatory locks instead of advisory locks | 6M | CO4 | 5 |
| | b) Explain the purpose of the open () and close () operations. | 6M | CO4 | 2 |

UNIT-V

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|----|----------------------------------------------------------------------------------------------------------------------------|-----|-----|---|
| 9. | Discuss the strengths and weaknesses of implementing an access matrix using access lists that are associated with objects. | 12M | CO5 | 2 |
|----|----------------------------------------------------------------------------------------------------------------------------|-----|-----|---|

OR

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|-----|-------------------------------------------------------------------------|-----|-----|---|
| 10. | Explain the role of protection goals and principles in system security. | 12M | CO5 | 3 |
|-----|-------------------------------------------------------------------------|-----|-----|---|

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

Hall Ticket Number :										
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R-20

Q.P.Code: 20DF22T

M.C.A. II Semester Supplementary Examinations Jan/Feb 2024

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

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|-----------------------------------------------------------------------------------------------------------------------------------------------|----|---|------|
| 1. a) Discuss the int(), float(), str(), chr() and complex() type conversion functions with examples. | 6M | 1 | 1, 3 |
| b) Describe the “is” and is “not” operators and “type()” function. Also, discuss why Python is called as dynamic and strongly typed language. | 6M | 1 | 1, 3 |

OR

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|---------------------------------------------------------------------------------------------------|----|---|------|
| 2. a) What is the lambda function? Explain with an example of addition of two numbers. | 6M | 1 | 1, 3 |
| b) Discuss various methods of importing modules in Python programs. Which method is best? Explain | 6M | 1 | 1, 3 |

UNIT-II

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|-------------------------------------------------------------------------------------------------------------|----|---|------|
| 3. a) Write a python program to accept name from the user and verify whether the user is authorized or not. | 6M | 1 | 1, 3 |
| b) Write a python program to find biggest of two numbers using conditional if. | 6M | 1 | 1, 3 |

OR

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|------|
| 4. a) Write a python program to accept n numbers and store them in a list. Then print the list without odd numbers in it | 6M | 1 | 1, 3 |
| b) For a=['hello', 'how', [1,2,3], [[10,20,30]]] what is the output of following statement (i) print(a[: :]) (ii) print(a[-3][0]) (iii) print(a[2][: -1]) (iv) print(a[0][: : -1]) | 6M | 1 | 1, 3 |

UNIT-III

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|--------------------------------------------------------------------------------------|----|---|------|
| 5. a) What is function? Explain functions concept in python with any example program | 6M | 2 | 2, 3 |
| b) Write a brief note on mapping functions in Dictionary using any example | 6M | 2 | 2, 3 |

OR

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|---------------------------------------------------------------------------------|----|---|------|
| 6. a) Elaborate the sequence of steps to encrypt and decrypt strings in python. | 6M | 2 | 2, 3 |
| b) Develop a python program to perform string concatenation and comparison | 6M | 2 | 2, 3 |

UNIT-IV

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|---------------------------------------------------------------------------------------------------------------------------|----|---|---|
| 7. a) Write the syntax to create, open and close a file? | 6M | 3 | 3 |
| b) List out different types of file modes in python? Write the syntax for import and to import all objects from a module? | 6M | 3 | 3 |

OR

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|--------------------------------------------------------------------------|----|---|---|
| 8. a) List and explain various string methods in python with examples. | 6M | 3 | 3 |
| b) Develop a python program to find the substring within a given string. | 6M | 3 | 3 |

UNIT-V

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|----------------------------------------------------------------------------------------------------------------|----|---|------|
| 9. a) What do you mean by recursion? Write a recursive function to compute the factorial of an input number N. | 6M | 1 | 1, 3 |
| b) What are the different types of inheritance supported by python? Explain. | 6M | 1 | 1, 3 |

OR

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|------|
| 10. a) Discuss the object oriented features and explain public and private data members with examples. | 6M | 5 | 2, 3 |
| b) Define a class named as Circle. Use a class variable to define the value of constant PI. Use this class variable to calculate area and circumference of a circle with specified radius? | 6M | 5 | 2, 3 |

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

Hall Ticket Number :

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R-20

Code: 20DF24T

M.C.A. II Semester Supplementary Examinations Jan/Feb 2024

Computer Networks

Max. Marks: 60

Time: 3 Hours

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

UNIT-I

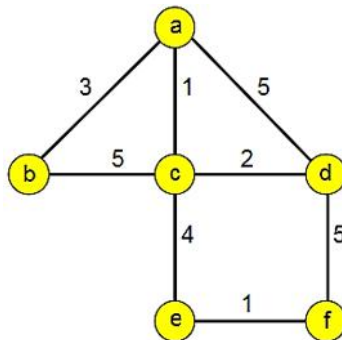
- | | Marks | CO | BL |
|---------------------------------------------------------------------------------------------------|-------|-----|----|
| 1. Describe various network topologies in details with suitable networking devices. | 12M | CO1 | L1 |
| OR | | | |
| 2. Describe the working mechanism of packet switching and circuit switching with proper diagrams. | 12M | CO1 | L1 |

UNIT-II

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|---------------------------------------------------------------------------------------------------------------------|-----|-----|----|
| 3. Summarize the Carrier Sense Multiple Access Protocols with available persistence methods with suitable diagrams. | 12M | CO2 | L2 |
| OR | | | |
| 4. Discuss the applications of cyclic redundancy check (CRC) with a suitable example. | 12M | CO2 | L2 |

UNIT-III

5. The network is shown in the figure below, uses a Link State Routing protocol. Calculate a Shortest Path Tree for node A, using Dijkstra's algorithm.



OR

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|------------------------------------------------------------------------|-----|-----|----|
| 6. Illustrate the tunneling in computer networks with proper diagrams. | 12M | CO3 | L3 |
|------------------------------------------------------------------------|-----|-----|----|

UNIT-IV

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|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|
| 7. Summarize the components of Transmission Control Protocol (TCP) header. Explain the significance of each component in detail with TCP header format. | 12M | CO4 | L5 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|

OR

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|------------------------------------------------------------------------|-----|-----|----|
| 8. Justify the need and working mechanism of Domain Name System (DNS). | 12M | CO4 | L5 |
|------------------------------------------------------------------------|-----|-----|----|

UNIT-V

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|------------------------------------------------------------------------------------------------------------|-----|-----|----|
| 9. Analyze the process of encryption and decryption in Advanced Encryption Standard (AES) with an example. | 12M | CO5 | L4 |
| OR | | | |
| 10. Infer Asymmetric Encryption: Justify, Why Your Security Depends on It. | 12M | CO5 | L4 |

END

Q.P.Code: 20DF2GT

M.C.A. II Semester Supplementary Examinations Jan/Feb 2024

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) Discuss the various asymptotic notations used for time complexity using a neat diagram. 8M 2 2
- b) Write the differences between debugging and profiling. 4M 1 1

OR

2. a) Analyze the recursive program for the tower of Hanoi problem. 6M 1 3
- b) Analyze the recurrence relation $T(n) = T(n-1) + 1$ and show that $T(n) = \theta(n)$ is asymptotically bounded by $\theta(n)$. 6M 2 4

UNIT-II

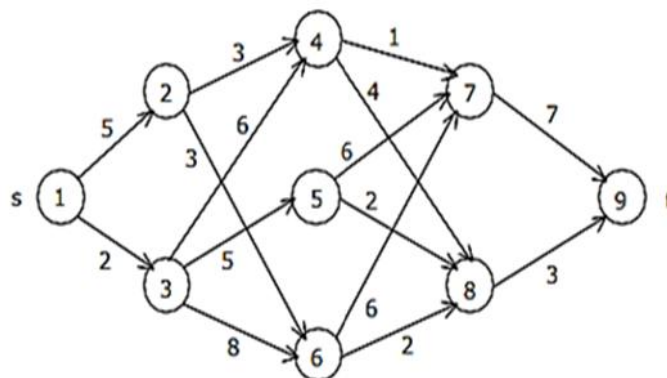
3. a) Explain in detail the Quick sorting method and its time complexity. 6M 2 3
- b) Find the location of 45 in the given array by applying the Binary search algorithm. $A = (9, 12, 15, 24, 30, 36, 45, 70)$ 6M 2 3

OR

4. a) Illustrate the operation of merge sort on the following array. $A = (3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5, 8, 9)$ 6M 2 3
- b) What is a stable sorting method? Is Quicksort a stable sorting method? Justify it. 6M 2 2

UNIT-III

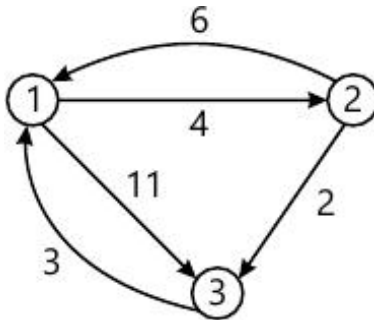
5. a) Solve the following 0/1 Knapsack problem using dynamic programming Let $n=3$, $p=\{1,2,5\}$, $w=(2,3,4)$ and $m=6$. 6M 3 3
- b) Find the minimum cost path from s to t in the multistage graph of the five stages shown in the following figure using the forward approach.



6M 3 3

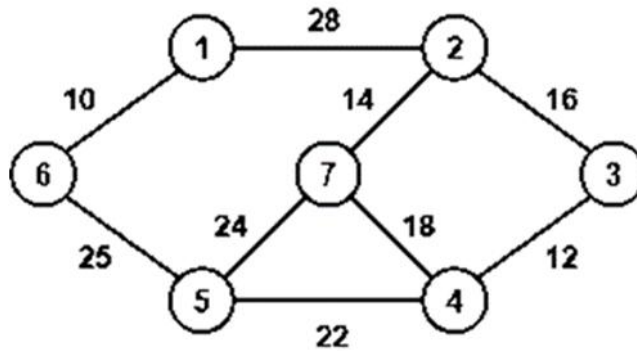
OR

6. a) Find the all-pair shortest path problem for the following graph using the Floyd-Warshall algorithm.



6M 3 3

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



6M 3 3

UNIT-IV

7. a) Draw and explain the state space tree for the 4-queens problem that is generated during backtracking. 8M 4 3
 b) What are the searching techniques that are commonly used in the Branch-and-Bound method? 4M 4 2

OR

8. a) Draw the portion of the state space tree generated by LCBB for the 0/1 Knapsack for instance $n=5$,
 $(p_1, p_2, p_3, p_4, p_5) = (10, 15, 6, 8, 4)$,
 $(w_1, w_2, w_3, w_4, w_5) = (4, 6, 3, 4, 2)$ and $m=12$. 10M 3 3

- b) Define the sum of the subset Problem. 2M 3 2

UNIT-V

9. a) Explain the classes of NP-Hard and NP-Complete. 6M 3 2
 b) Discuss the Clique's decision problems. 6M 5 2

OR

10. a) State and prove Cook's theorem. 10M 5 3
 b) Define the P class of problem. 2M 3 2

END