QP.Code	U21AM-1A	Reg.No	

KPR Institute of Engineering and Technology
(Autonomous)
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Learn Beyond

Dept.: CS
Ac.Yr.: 2024 – 2025

Course Code & Title	:	U21AM402	ALGORITHMICS	
Year	:	II	Semester: 04	Date: 25.03.205 AN
CIAT	:	I	Duration: 90 Minutes	Maximum Marks: 60

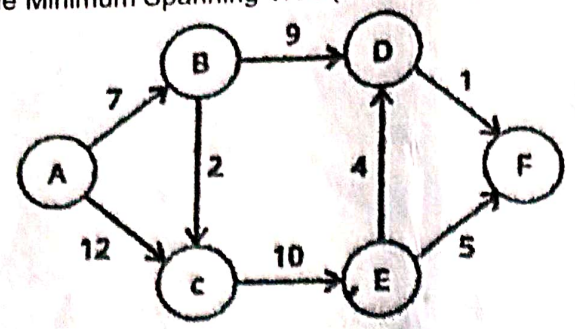
Q. No	Section – A (10X1=10 Marks) Answer All Questions	Marks	BT	CO
1	Asymptotic notations are used to describe _____of and algorithm. a Space complexity b Time Complexity c Both time and space complexity d Data structure	1	R	CO1
2	_____ measure the time complexity of a program. a The amount of memory used b The number of processors required c The number of operations performed as a function of input size d The programming language used	1	R	CO1
3	Which of the following is not an asymptotic notation. a Big-O b Theta c Omega d Lambda	1	U	CO1
4	Prim's algorithm is used for_____ a Finding the shortest path in a graph with negative weights b Finding the shortest path in a graph with non-negative weights c Finding the minimum spanning tree d Sorting an array	1	R	CO1
5	Recursive algorithms are typically analyzed using _____ mathematical technique. a Graph Theory b Recurrence relations c Boolean algebra d Hashing	1	U	CO2
6	In Network Flow _____ method is used to find the maximum flow. a Dijkstra's Algorithm b Prim's Algorithm c Ford- Fulkerson d Kruskal Algorithm	1	U	CO2
7	Which of the following is not a characteristic of graph. a Connectivity b Strong Connectivity c Bi-Connectivity d Encapsulation	1	R	CO2
8	_____ has the highest time complexity. a O(n) b O(n log n) c O(log n) d $O(n^2)$	1	U	CO2
9	_____sorting algorithm uses the Divide and Conquer approach. a Bubble Sort b Quick Sort c Insertion Sort d Selection Sort	1	U	CO3
10	What is the main Disadvantage of Merge Sort. a It is not a stable b Is has a worst-case time complexity of $O(n^2)$ c It requires addition memory space d Is does not work for large inputs	1	U	CO3

Q.No	Section – B (10X2=20 Marks) Answer All Questions	Marks	BT	CO
11	Define an analysis of algorithm?	2	R	CO1
12	What is Big-O Notation?	2	U	CO1
13	Write the general plan for analyzing time complexity of a non-recursive algorithm?	2	R	CO1
14	How can you define the space complexity for any program?	2	R	CO1
15	What is an Augmenting Path?	2	R	CO2
16	Define Graph with representations?	2	R	CO2
17	What is Dijkstra's algorithm?	2	U	CO2
18	Compare strong connected and Bi connected graph?	2	R	CO2
19	What are the main steps in the Merge sort algorithm?	2	R	CO3
20	Write the advantage and disadvantage of Divide and Conquer technique?	2	R	CO3

Q.No		Section – C (1X6=6 Marks & 2X12=24 Marks) Answer All Questions	Marks	BT	CO
21 a)		With relevant example, illustrate the three notations (Big -O, Theta, and Omega)	12	U	CO1
		(Or)			
21 b)	I	Write an algorithm that finds the sum of elements in an array and what is the space complexity.	6	AP	CO1
	II	Explain the time complexity of the Fibonacci series using recursive algorithm?	6	AP	CO1
22 a)		Write to construct the ranking matrix and find the best pair. Compare the preferences of both men and women table below.	12	AP	CO2

Person	1st Choice	2nd Choice	3rd Choice	Person	1st Choice	2nd Choice	3rd Choice
Gandhi	Lakshmibai	Sarojini	Nachiyar	Sarojini	Nehru	Bhagat	Gandhi
Nehru	Lakshmibai	Nachiyar	Sarojini	Lakshmibai	Bhagat	Gandhi	Nehru
Bhagat	Nachiyar	Lakshmibai	Sarojini	Nachiyar	Nehru	Bhagat	Gandhi

(Or)

22 b)	To find the Minimum Spanning Tree (MST) using Prims Algorithms 	12	AP	CO2
23 a)	Simulate Quick Sort algorithm for the following example. 25 | 36 | 12 | 4 | 5 | 16 | 58 | 54 | 24 | 16 | 9 | 65 | 78	6	Uss	CO
	(Or)			
23 b)	Describe the algorithm for finding the maximum and minimum elements in ana array using the Divide and Conquer approach?	6	U	CO