

**University of Mumbai**  
**Examination 2020 under cluster \_\_\_\_ (Lead College Short name)**

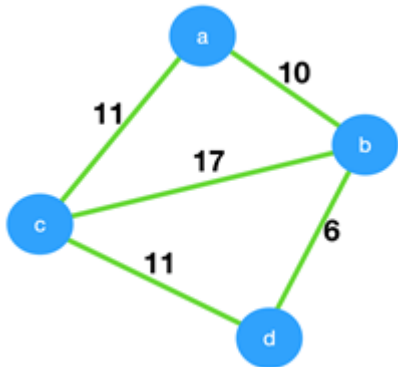
Program: Information Technology

Curriculum Scheme: Rev2016

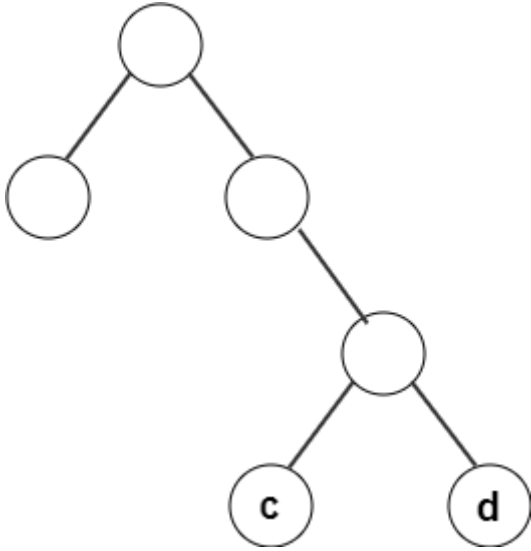
Examination: Third Year Semester V

Course Code: \_\_\_\_\_ and Course Name: Advance Data Structure and Analysis of Algorithms.  
 Time: 1 hour Max. Marks: 50

For the students:- All the Questions are compulsory and carry equal marks .

Q1.	Merge sort uses which of the following technique to implement sorting?
Option A:	backtracking
Option B:	Greedy algorithm
Option C:	Divide and conquer
Option D:	Dynamic programming
Q2.	Heap sort is an implementation of _____ using a descending priority queue.
Option A:	Insertion sort
Option B:	Selection sort
Option C:	Bubble sort
Option D:	Merge sort
Q3.	<p>Given a pattern of length- 5 window, find the spurious hit in the given text string.</p> <p>Pattern: 3 1 4 1 5  Modulus: 13  Index: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20  Text: 2 3 5 9 0 2 3 1 4 1 5 2 6 7 3 9 9 2 1 3 9</p>
Option A:	6-10
Option B:	12-16
Option C:	3-7
Option D:	13-17
Q4.	<p>Consider the given graph.</p>  <p>What is the weight of the minimum spanning tree using the Prim's algorithm, starting from vertex a?</p>

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Option A:	23
Option B:	28
Option C:	27
Option D:	11
Q5.	Consider a complete graph G with 4 vertices. The graph G has ____ spanning trees.
Option A:	15
Option B:	8
Option C:	16
Option D:	13
Q6.	What happens when the value of k is 0 in the Floyd Warshall Algorithm?
Option A:	1 intermediate vertex
Option B:	0 intermediate vertex
Option C:	N intermediate vertices
Option D:	N-1 intermediate vertices
Q7.	Given items as {value,weight} pairs {{40,20},{30,10},{20,5}}. The capacity of knapsack=20. Find the maximum value output assuming items to be divisible.
Option A:	60
Option B:	80
Option C:	100
Option D:	40
Q8.	<p>From the following given tree, what is the computed codeword for 'c'?</p>  <pre> graph TD     A(( )) --- B(( ))     A --- C(( ))     C --- D(( ))     D --- E((c))     D --- F((d)) </pre>
Option A:	111
Option B:	101
Option C:	110
Option D:	011

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Q9.	Consider the matrices P, Q and R which are 10 x 20, 20 x 30 and 30 x 40 matrices respectively. What is the minimum number of multiplications required to multiply the three matrices?
Option A:	18000
Option B:	12000
Option C:	24000
Option D:	32000
Q10.	You are given a knapsack that can carry a maximum weight of 60. There are 4 items with weights {20, 30, 40, 70} and values {70, 80, 90, 200}. What is the maximum value of the items you can carry using the knapsack?
Option A:	160
Option B:	200
Option C:	170
Option D:	90
Q11.	Which of the following methods can be used to solve the longest common subsequence problem?
Option A:	Recursion
Option B:	Dynamic programming
Option C:	Both recursion and dynamic programming
Option D:	Greedy algorithm
Q12.	What is the time complexity of the brute force algorithm used to find the longest common subsequence?
Option A:	$O(n)$
Option B:	$O(n^2)$
Option C:	$O(n^3)$
Option D:	$O(2^n)$
Q13.	B-tree of order n is a order-n multiway tree in which each non-root node contains _____
Option A:	at most $(n - 1)/2$ keys
Option B:	exact $(n - 1)/2$ keys
Option C:	at least 2n keys
Option D:	at least $(n - 1)/2$ keys
Q14.	A B+ tree can contain a maximum of 7 pointers in a node. What is the minimum number of keys in leaves?
Option A:	6
Option B:	3
Option C:	4
Option D:	7

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Q15.	What traversal over trie gives the lexicographical sorting of the set of the strings?
Option A:	Postorder
Option B:	Preorder
Option C:	Inorder
Option D:	levelorder