University of Mumbai
Examination 2020

Program: **Computer Engineering**
Curriculum Scheme: Rev2016
Examination: Second Year Semester III
Course Code: CSC305 and Course Name: Data Structures

Time: 1 hour Max. Marks: 50

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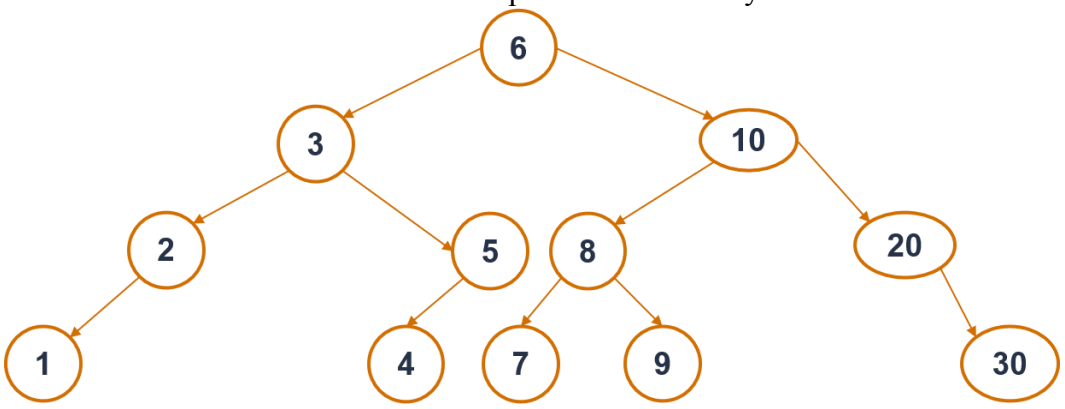
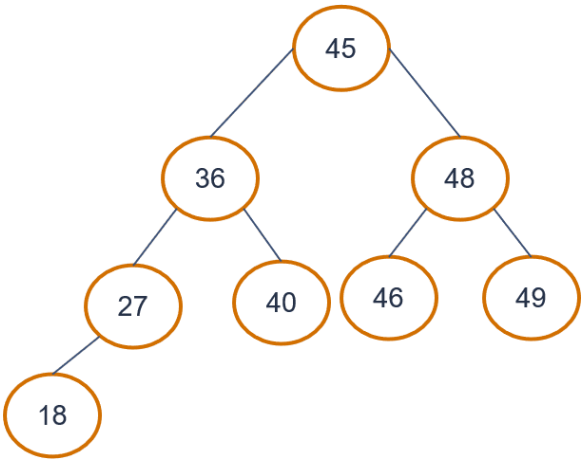
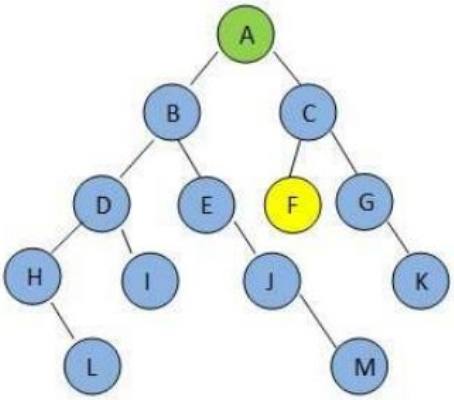
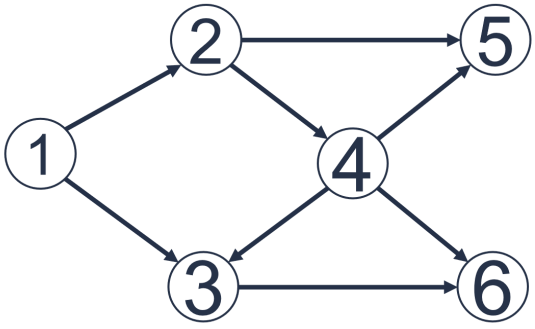
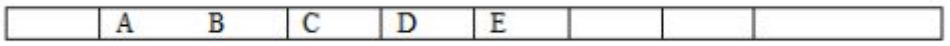
For the students:- All the Questions are compulsory and carry equal marks .

Q1.	A binary tree T has n leaf nodes. The number of nodes of degree 2 in T is
Option A:	$log_2 n$
Option B:	n-1
Option C:	n/2
Option D:	n
Q2.	Level order traversal of a rooted tree can be done by starting from the root and performing
Option A:	Pre-order Traversal
Option B:	Post-Order Traversal
Option C:	Breadth First Search
Option D:	Depth First Search
Q3.	What will be the Pre-order traversal output of below binary tree: 
Option A:	6 3 2 1 5 4 10 8 7 9 20 30
Option B:	1 2 3 4 5 6 7 8 9 10 20 30
Option C:	1 2 4 5 3 7 9 8 30 20 10 6
Option D:	6 3 10 2 5 8 20 1 4 7 9 30
Q4.	Given the frequency for the following symbols, compute the Huffman code for each symbol.

Letter	A	B	C	D	E
Frequency	19	13	8	7	7

Option A:	A= 1, B= 011, C= 010, D= 000, E= 001
Option B:	A= 1, B= 000, C= 001, D= 011, E= 010
Option C:	A= 0, B= 100, C= 101, D= 111, E= 110
Option D:	A= 0, B= 111, C= 110, D= 100, E= 101
Q5.	 After adding a left child to the node 18 in the AVL Tree above, how many nodes will be unbalanced?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q6.	Select the correct statement from below with respect to the M-way search tree.
Option A:	Number of Subtree may vary from 1 to M
Option B:	A node can have 1 to M-1 values in every node.
Option C:	Compulsory every node should have M-1 values
Option D:	Compulsory every node should have M subtrees.
Q7.	The postfix form of (A + B) / (C + D) – (D * E)
Option A:	AB+CD+/DE*–
Option B:	AB+/CD+-DE*
Option C:	AB+CD/+DE*-
Option D:	AB+CD+/-DE*

Q8.	Starting from the node A at the top, which algorithm will visit the least number of nodes before visiting the node F? 
Option A:	Breadth First Search
Option B:	Depth First Search
Option C:	DFS and BFS will visit same number of nodes
Option D:	Both BFS and DFS will not visit node F
Q9.	Result of the postfix expression 832*4+- is?
Option A:	3
Option B:	2
Option C:	-3
Option D:	-2
Q10.	To represent hierarchical relationships between elements, Which data structure is suitable?
Option A:	Stack
Option B:	Queue
Option C:	Tree
Option D:	Graph
Q11.	What will be the topological ordering for the below graph. 
Option A:	1 2 3 4 5 6
Option B:	1 2 3 4 6 5
Option C:	1 3 2 4 5 6
Option D:	1 2 4 5 3 6

Q12.	Consider the linear queue given below which has FRONT = 1 and REAR = 5. Now perform the following operations on the queue: (a) Add G (b) Delete two letters(c) Add H (d) Add I (e) Delete three letters 
Option A:	H,G,I
Option B:	G,H,I
Option C:	G,I,H
Option D:	H,I,G
Q13.	Which of the following is an example of stack?
Option A:	Person standing for withdrawing money
Option B:	A set of bangles worn by a lady on her arm
Option C:	Round Robin Process scheduling
Option D:	Network Printing Job
Q14.	At a hill station, the parking lot is one long drive way snaking up a hill side. Cars drive in and park right behind the car in front of them, one behind the other. A car can't leave until all the cars in the front of it are left. Is the parking lot more like:
Option A:	Array
Option B:	Stack
Option C:	Queue
Option D:	Linked List
Q15.	How many stacks are required to implement Queue?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q16.	Which among the following is a non-linear data structure?
Option A:	Stack
Option B:	Queue
Option C:	Array
Option D:	Tree
Q17.	Which of the following data structures is based on LIFO principle?
Option A:	Tree
Option B:	Queue
Option C:	Stack
Option D:	Graph

Q18.	Which type of linked list begins with a pointer to the first node and each node contains a pointer to the next node , and the pointer in the last node points back to the first node?
Option A:	Circular singly linked list
Option B:	Circular doubly linked list
Option C:	Singly linked list
Option D:	Doubly linked list
Q19.	Consider a circular doubly linked list of integer with five nodes. Compute the number of pointers present in the circular doubly linked list
Option A:	5
Option B:	8
Option C:	12
Option D:	10

Q20.	Given a C program takes a singly linked list as an input. It modifies the linked list by moving the last element to the front of the list and returns the modified list. In the given code fill in the blank code by choosing the appropriate option.
	
	`typedef struct node {`
	`  int value;`
	`  struct node *next;`
	`} Node;`
	`Node *move_to_front(Node *head) {`
	`  Node *p, *q;`
	`  if ((head = = NULL || (head->next = = NULL)) return head;`
	`  q = NULL; p = head;`
	`  while (p-> next !=NULL) {`
	`  q=p;`
	`  p=p->next;`
	`}`
	`_____`
	`  return head;`
	`}`

Option A:	q = NULL; p->next = head; head = p;
Option B:	q->next = NULL; head = p; p->next = head;
Option C:	head = p; p->next = q; q->next = NULL;
Option D:	q->next = NULL; p->next = head; head = p;
Q21.	Which of the following sorting algorithm uses divide and conquer technique?
Option A:	Merge Sort
Option B:	Insertion Sort
Option C:	Selection Sort
Option D:	Heap Sort
Q22.	Which of the following open addressing collision resolution technique is applied in the Berkeley Fats File System to allocate the free blocks?

Option A:	Linear Probing
Option B:	Double Hashing
Option C:	Quadratic Probing
Option D:	Rehashing
Q23.	A certain sorting technique was applied to the following data set, 45, 1, 27, 36, 54, 90 After two passes, the rearrangement of the data set is given as below: 1, 27, 45, 36, 54, 90 Identify the sorting algorithm that was applied.
Option A:	Bubble Sort
Option B:	Merge Sort
Option C:	Insertion Sort
Option D:	Selection Sort
Q24.	Given a hash table of size 100, map the key 1892 to an appropriate location in the hash table using the Multiplication function.
Option A:	30
Option B:	32
Option C:	34
Option D:	35
Q25.	Linear Search is inefficient as compared to binary search when array is ……..
Option A:	small, unsorted
Option B:	small, sorted
Option C:	large, unsorted
Option D:	large, sorted