

D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY
KASABA BAWADA KOLHAPUR-416006
(An Autonomous Institute)
S. Y. B. Tech-ETC (Semester-III)

Q. Paper Code:

22syET204304

END SEMESTER EXAMINATION, OCT./NOV.- 2021-22

COURSE NAME: Data Structures and Algorithms COURSE CODE: 201ETL204

Day and Date: Tuesday, 25/01/2022

Seat No :

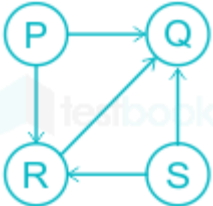
Time:10.00 am to 11.00 am

Max. Marks- 50

OBJECTIVE

		Correct Option
Q. 1)	If for an algorithm time complexity is given by $O(n)$ then complexity of it is: A) constant B) exponential C) linear D) none of the mentioned	<input type="text" value="C"/>
Q. 2)	What does it mean when we say that an algorithm X is asymptotically more efficient than Y? A) X will be a better choice for all inputs except possibly large inputs B) Y will be a better choice for small inputs C) X will be a better choice for all inputs D) X will be a better choice for all inputs except possibly small inputs	<input type="text" value="D"/>
Q.3)	Consider the following pseudo code. What is the total number of multiplications to be performed? A) One-third of the product of the 3 consecutive integers B) One-sixth of the product of the 3 consecutive integers. C) Half of the product of the 3 consecutive integers D) None of the above	<input type="text" value="B"/>
Q. 4)	Which of the following operations is not $O(1)$ for an array of sorted data. You may assume that array elements are distinct. A) Find the i th largest element B) Find the i th largest element C) Delete an element D) All of the above	<input type="text" value="C"/>
Q. 5)	A three dimensional array in 'C' is declared as <code>int A[x][y][z]</code> . Consider that array elements are stored in row major order and indexing begins from 0. Here, the address of an item at the location <code>A[p][q][r]</code> can be computed as follows (where w is the word length of an integer): A) $\&A[0][0][0] + w(y * z * q + z * p + r)$ B) $\&A[0][0][0] + w(x * y * p + z * q + r)$ C) $\&A[0][0][0] + w(x * y * q + z * p + r)$ D) $\&A[0][0][0] + w(y * z * p + z * q + r)$	<input type="text" value="D"/>
Q. 6)	Each array declaration need not give, implicitly or explicitly, the information about A) the first data from the set to be stored B) the name of array C) the index set of the array D) the data type of array	<input type="text" value="A"/>
Q. 7)	Consider an implementation of unsorted singly linked list. Suppose it has its representation with a head pointer only. Given the representation, which of the following operation can be implemented in $O(1)$ time? i) Insertion at the front of the linked list ii) Insertion at the end of the linked list iii) Deletion of the front node of the linked list iv) Deletion of the last node of the linked list A) I and II B) I and III C) I, II and III D) I, III and IV	<input type="text" value="B"/>
Q. 8)	What does the following function do for a given Linked List with first node as head? <pre>void fun1(struct node* head) { if(head == NULL) return; fun1(head->next); printf("%d ", head->data); }</pre>	<input type="text" value="C"/>

	}		
	A) Prints all nodes of linked lists	B) Prints alternate nodes of Linked List	
	C) Prints all nodes of linked list in reverse order	D) Prints alternate nodes in reverse order	
Q. 9)	Which of the following points is/are true about Linked List data structure when it is compared with array		D
	A) Arrays have better cache locality that can make them better in terms of performance.	B) Random access is not allowed in a typical implementation of Linked Lists	
	C) It is easy to insert and delete elements in Linked List	D) All of the above	
Q. 10)	In worst case, the number of comparison need to search a singly linked list of length n for a given element is		B
	A) log n	B)n	
	C) n/2	D) log ₂ n-1	
Q. 11)	A queue is implemented using an array such that ENQUEUE and DEQUEUE operations are performed efficiently. Which one of the following statements is CORRECT (n refers to the number of items in the queue)?		D
	A) At most one operation can be performed in O(1) time but the worst case time for the other operation will be $\Omega(n)$	B) The worst case time complexity for both operations will be $\Omega(n)$	
	C) Worst case time complexity for both operations will be $\Omega(\log n)$	D) Both operations can be performed in O(1) time	
Q.12)	Postfix form of following expression. D + (E * F)		B
	A) DEF +*	B) EFD *+	
	C) DEF * +	D) EF * D+	
Q. 13)	Consider the usual algorithm for determining whether a sequence of parentheses is balanced. The maximum number of parentheses that appear on the stack AT ANY ONE TIME when the algorithm analyzes: (()()())is:		B
	A) 4 or more	B)3	
	C)2	D)1	
Q. 14)	If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?		D
	A) ABDC	B) DCAB	
	C) DCBA	D) ABCD	
Q. 15)	A queue data-structure can be used for –		C
	A) recursion	B) expression parsing	
	C) resource allocation	D) all of the above	
Q. 16)	In delete operation of BST, we need inorder successor (or predecessor) of a node when the node to be deleted has both left and right child as non-empty. Which of the following is true about inorder successor needed in delete operation?		D
	A) Inorder successor may be an ancestor of the node	B) Inorder Successor is always a leaf node	
	C) Inorder successor is always either a leaf node or a node with empty right child	D) inorder successor is always either a leaf node or a node with empty left child	
Q. 17)	Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?		B
	A) 9 8 6 4 2 3 0 1 5 7	B) 0 1 2 3 4 5 6 7 8 9	
	C) 0 2 4 3 1 6 5 9 8 7	D) 7 5 1 0 3 2 4 6 8 9	
Q. 18)	The following numbers are inserted into an empty binary search tree in the given order: 10, 1, 3, 5, 15, 12, 16. What is the height of the binary search tree		C
	A)6	B)4	
	C)3	D)2	
Q. 19)	A binary tree T has n leaf nodes. The number of nodes of degree 2 in T is		D
	A) n	B) log ₂ n	
	C) 2 ⁿ	D) n-1	
Q. 20)	A threaded binary tree is a binary tree in which every node that does not have right child has a thread to its		A
	A) In-order successor	B) Pre-order successor	
	C) In-order predecessor	D) Post-order successor	

Q.21)	A graph in which all vertices have equal degree is known as ____		B
	A) Regular graph	B) Complete graph	
	C) Simple graph	D) Multi graph	
Q. 22)	What can be the techniques to avoid collision?		D
	A) Use uniform hashing	B) Make the hash function appear random	
	C) Use the chaining method	D) All of the mentioned	
Q. 23)	Graph traversal is different from a tree traversal, because		B
	A) trees are not connected.	B) trees have root.	
	C) graphs may have loops.	D) None is true as tree is a subset of graph.	
Q. 24)	A hash function h defined $h(\text{key}) = \text{key} \bmod 7$, with linear probing, is used to insert the keys 44, 45, 79, 55, 91, 18, 63 into a table indexed from 0 to 6. What will be the location of key 18 ?		C
	A)3	B)4	
	C)5	D)6	
Q. 25)	Consider the directed graph given below 		C
	A)The graph does not have any topological ordering	B)Both PQRS and SRQP are topological ordering	
	C) Both PSRQ and SPRQ are topological ordering	D) PSRQ is the only topological ordering	
