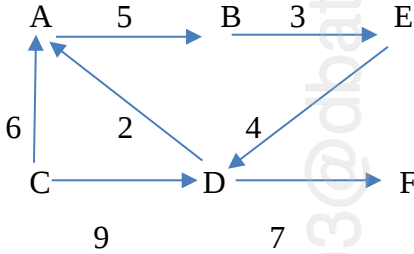


DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**Supplementary Summer Examination – 2024****Course: B. Tech Branch: Computer Engineering/Computer Science and Engineering Sem: III****Subject Name: Data Structures****Subject Code: BTCOC303****Max Marks: 60****Date: - 04/07/2024****Duration: - 3 Hrs.****Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question / answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Assume data wherever necessary and mention it clearly.

		(Level / CO)	Marks
Q. 1	Solve any Two of the following		
1.	What is primitive data structure? Differentiate between primitive and non-primitive data structures.	Understand	6
2.	Define space complexity of an algorithm. Determine the space complexity of the following program segment: <pre>int sum(int a[], int n) { int x = 0; for (int i=0; i<n; i++) { x = x + a[i]; } return x; }</pre> Note: Assume integer variable takes 4 bytes of memory space.	Analyze	6
3.	Define collision. Consider a hash table of size 13 and the hash function given is $h(x) = x \bmod 13$. Demonstrate how Linear probing handles collision while inserting keys 18, 41, 22, 44, 59, 32, 31, 73, in this order.	Apply	6
Q.2	Solve any Two of the following		
1.	Consider the stack of size 5 memory cells. Suppose initially stack contains A, B, C, D (Top of stack). Then the following operations are executed in order. Show the stack top and any other situation raised while doing each of the operations. i) Push(E) ii) Pop(top) iii) Push(F) iv) Push(G) v) Pop(top) vi) Push(H)	Apply	6

2.	Write algorithms for enqueue and dequeue operations on circular queue with example.	Evaluate	6
3.	Explain with suitable example concept of binary recursion.	Apply	6
Q.3	Solve any Two of the following		
1.	Describe circular linked list operations in detail.	Evaluate	6
2.	What is garbage collection? Who will run garbage collection program?	Remember	6
3.	Justify a linked list is a data structure that is based on dynamic memory allocation. List the advantages of linked list dynamic memory allocation.	Understand	6
Q.4	Solve any Two of the following		
1.	Explain different binary search tree traversal methods.	Understand	6
2.	How does graph can be represented using adjacency matrix? What will be the adjacency matrix for the below given directed weighted graph?  <pre> graph LR A -- 5 --> B B -- 3 --> E C -- 6 --> A C -- 9 --> D D -- 2 --> A D -- 7 --> F E -- 4 --> D </pre>	Apply	6
3.	Write short note on balanced trees.	Understand	6
Q.5	Solve any Two of the following		
1.	Describe how dictionaries can be implemented using skip lists.	Evaluate	6
2.	What is selection sort? Explain in detail with suitable example.	Apply	6
3.	Write short note on file handling.	Understand	6