ADAMAS UNIVERSITY PURSUE EXCELLENCE	**ADAMAS UNIVERSITY** **END-SEMESTER EXAMINATION: JANUARY 2021** **(Academic Session: 2020 – 21)**		
Name of the Program: **(Example: B. Sc./BBA/MA/B.Tech.)**	**B.Tech**	**Semester:** **(I/III/ V/ VII/IX)**	**III**
Paper Title :	**Data Structure and Algorithms**	**Paper Code:**	**ECS-CSM101**
Maximum Marks :	**40**	**Time duration:**	**3 Hours**
Total No of questions:	**8**	**Total No of Pages:**	**2**
(Any other information for the student may be mentioned here)			

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a) What is pointer variable? How is the pointer variable initialized?**
   b) Explain the difference between array and structure using small code snippet.
   c) What is the principle of STACK?
   d) What is Big-Oh notation?
   e) What is header node in linked list?

GROUP –B

Answer *any three* of the following $3 \times 5 = 15$

2. Define a structure account containing account number, Customer's name, Branch name and balance amount. Write an algorithm to store the information of bank account holders and print the list of customers for the given branch.

3. What is linked list? What are different types of linked list?

4. Compare among best, average, and worst case of time complexity of Bubble sort algorithm with justification

5. Write insertion and deletion algorithm using an example of a Queue.

GROUP –C

Answer *any two* of the following $2 \times 10 = 20$

6. a) What is Knapsack Problem? **2+3+5**
b) Can it be solved by recursion? Justify your answer.
c) What are stack operations? Explain all.

7. a) What is multidimensional array? **2+3+5**
b) How multidimensional array are initialized? Show any example.
b) Explain matrix multiplication using the concept of multidimensional array.

8. Show how an element can be inserted in-between two intermediate nodes in a linked list using an example. How do you delete the item if required from the above linked list?