

Total No. of Questions : 5]

SEAT No. : **PB828**

[Total No. of Pages : 2]

[6204]-12**First Year M.C.A. (Management)**

IT-12 : DATASTRUCTURE & ALGORITHMS
(Revised 2020 Pattern) (Semester-I)

Time : 2½ Hours

[Max. Marks : 50]

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.



- Q1) a)** Write an algorithm to print the node values of doubly linked list in reverse order. [6]
b) Write an algorithm push and pop operation of Stack. [4]

OR

- c)** Write an algorithm to traverse and print note values of singly linked list. [6]
d) Write an application of priority queue. [4]

- Q2) a)** Explain Graph traversals [DFs & BFs] with suitable example. [6]
b) Construct Binary search Tree (BST) for following data & Find height of tree. 5, 7, 9, 2, 6, 11, 17. [4]

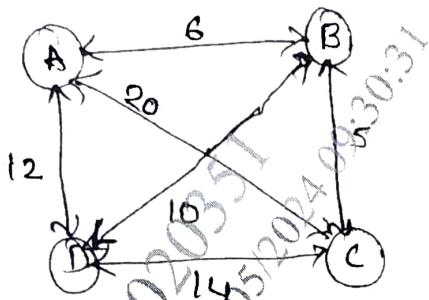
OR

- c)** Construct AVL Tree for the following data [6]
 MON, TUE, WED, THU, FRI, SAT, SUN.
d) Explain collision resolution techniques any two. [4]

- Q3) a)** Apply the rain terrace algorithm to the following problem [3, 4, 0, 2, 3, 1]
 Draw the figure & step by step solution. [6]
b) Describe the rules for solving N-queen Problem. [4]

OR

- c) Find shortest Path using travelling salesman problem for following graph. [6]



- d) Discuss knight tour problem with suitable example. [4]

- Q4)* a) Apply Binary search algorithm on following data [Step by steps] [6]

23, 56, 91, 72, 12, 08, 05, 02, 16, 38

Search Key = 72

- b) Apply Euclidean algorithm to find GCD [4]

A=10 B=15.

OR

- c) Sort the following data using quick sort step by step. [6]

[10, 80, 30, 90, 40, 50, 70]

- d) Explain fast powering with suitable example [4]

- Q5)* a) Consider the given instance of 0/1 Knapsack problem [10]

N=4 M=8 P=(3, 4, 6, 5)

W=(2, 3, 1, 4)

Using dynamic Programming the optimal profit & solution vector.

OR

- b) Find the longest common sub-sequence for the following string using dynamic programming. [10]

X=conference Y=Reference

Also calculate the length longest common sub-sequence.

