



Register Number:

Date: 11-01-2020

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE – 27
MSC(DATA ANALYTICS) – I SEMESTER
SEMESTER EXAMINATION – JANUARY 2021
BDA1420: COMPUTING FOR DATA SCIENCE

Time : 2 1/2 hours

Max Marks : 70

THIS PAPER CONTAIN TWO PRINTED PAGES AND ONE PART
STUDENTS ARE ALLOWED TO USE SCIENTIFIC CALCULATORS

Answer any SEVEN of the following

(7X10=70 Marks)

1. Why R is used for data analytics? Justify your answer. Compare and contrast Java and Python programming languages.
2. When should we use binary search instead of linear search. Write the pseudo code for binary search.
3. Arrange the given array in ascending order using insertion sort. Explain each step.

$A = [2, 5, 1, 243, 234, 11]$

4. Explain max heap algorithm using the following data set $A = \{4, 3, 7, 1, 8, 5\}$
5. Find the real root of the given equation $x^3 - 2x - 5 = 0$ (4 iterations) using bisection method

$$x^3 - 2x - 5 = 0$$

6. Solve the problem using Newton Raphson method (3 iterations)

$$f(y) = y^3 - 2y - 5 = 0$$

7. Write the algorithm for the steepest decent method. Solve the problem using Steepest decent method (Upto 4 iterations)
 $\min f(x, y) = 25x^2 + y^2$ where $x = 0.6, y = 4$
8. Why do we use Monte carlo simulation? For a particular shop, the daily demand of an item with associated probabilities is given below:
For daily demands 0, 10, 20, 30, 40, 50 the respective Probabilities are 0.01, 0.20, 0.15, 0.50, 0.12, 0.02
For the sequence of random numbers (out of 100 random numbers generated between 00-99) used are 25, 39, 65, 76, 12, 05, 73, 89, 19, 49. What will be the average daily demand?

9. Generate random number stream $(X_1, X_2, \dots, X_{10})$ using linear congruential generator

$$X_i = (a \cdot X_{i-1} + c) \bmod m \text{ with } X_0 = 27, a = 17, c = 4, \text{ and } m = 100$$

Write briefly about the applications of Monte carlo simulation.

BDA1420-A-20