ST.JOSEPH'S UNIVERSITY, BENGALURU-27
MSc (BIG DATA ANALYTICS) – I SEMESTER
SEMESTER EXAMINATION: OCTOBER 2022
(Examination conducted in December 2022)
BDA 1421 – COMPUTING FOR DATA SCIENCE

Time: 2 Hours   **Max Marks: 50**
This paper contains TWO printed pages and THREE parts

PART A

Answer ALL Questions   **5 X 1 = 5**

1. Many quantitative analysts use R as their_____tool?
   a. Leading Tool
   b. Programming Tool
   c. Both the above

2. Where is linear searching used?
   a. When the list has only a few elements
   b. When performing a single search in an unordered list
   c. Used all the time
   d. When the list has only a few elements and when performing a single search in an unordered list

3. In heap sort, after deleting the last minimum element, the array will contain elements in?
   a. Increasing sorting order
   b. Decreasing sorting order
   c. Tree inorder
   d. Tree preorder

4. Gradient Descent is an iterative optimization algorithm, used to find the
   a. Maximum value of function
   b. Minimum value of the function
   c. Minimum value of variable
   d. Maximum value of variable

5. Which of the following are disadvantages Monte Carlo Simulation?
   a. Time consuming
   b. The results of this method are only the approximation of true values, not the exact
   c. Difficult to calculate
   d. Both i) and ii)

PART B

Answer any FIVE Questions   **5 X 3 = 15**

6. When do we prefer to use linear search? What are the advantages of binary search?

7. Using Selection sort Algorithm, arrange the given sequence of number in an ascending order – 10,23,8,6,4,9,16.

8. Write Insertion sort algorithm.

9. Heapify (Min Heap) the given sequence of numbers – 12,10,9,21,32,56,28,74,12,64.

10. Find the first two approximation of the root the $f(x)=0$ where $f(x)= x^2 + 3x -5$ in [1,2] using Bisection method.

11. Find the gradient (first 3 steps) for the function $x^2 – 4x +1= 0$, considering learning rate as 0.1 and starting point as x=9.

12. Find the Random Numbers with $x_0 =79$, N = 100, $P_1 = 263$, and $P_2 = 71$

PART C

Answer any THREE Questions   **3 X 10 = 30**

13. Explain Binary search algorithm with example.

14. Explain quick sort with an example.

15. Solve $2x^3 -2.5x -5 =0$ for the root in [1,2] by Newton-Raphson method.

16. For a particular shop, the daily demand of an item with associated probabilities is given below:

Daily Demand	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

If random number stream $(X_1, X_2….. X_{10})$ is generated using linear congruential generator $(X_i = a*X_{i-1} + c)$mod m with $X_0 = 27$, a = 17, c = 4, and m = 100, find the average daily demand for the first ten days.