18. (a) Elucidate minheap.

Or

(b) Describe about binary heap.

19. (a) Give a short note on B-tree.

Or

(b) Demonstrate red-black tree.

20. (a) Illustrate single source shortest path algorithm.

Or

(b) Determine All-Pairs shortest paths.

PART C — (3 × 10 = 30)

Answer any THREE questions.

21. Write a detailed note singly linked list with example.

22. Explain the following in detail: (a) Separate chaining (b) Universal hashing (c) Extendible hashing.

23. Illustrate the following basic heap operations: (a) Insert (b) delete (c) percolate down.

24. Describe in detail about multi-way search trees.

25. Elucidate topological sort with examples.

S.No. 3102 **P 22 ITCC 1 B**

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Information Technology — Core Choice Course

ADVANCED DATA STRUCTURES

Time : Three hours Maximum : 75 marks

PART A — (20 marks)

Answer ALL questions.

I. Choose the Correct Answer (5 × 1 = 5)

1. The data structure required for Breadth First Traversal on a graph is_____

(a) Stack (b) Array

(c) Queue (d) Tree

2. Which of the following problems occur due to linear probing?

(a) Primary collision (b) Secondary collision

(c) Separate chaining (d) Extendible hashing

3. What is the best-case complexity in building a heap?

(a) O (nlogn) (b) O (n2)

(c) O (n*longn *logn) (d) O (n)

4. Which of the following is the most widely used external memory data structure?

(a) AVL tree

(b) B-tree

(c) Red-black tree

(d) Both AVL tree and Red-black tree

5. Which of the following is an all pair shortest path algorithm of graphs?

(a) Bellman - Ford algorithm

(b) Ford - Fulkerson algorithm

(c) Floyd – Warshall algorithm

(d) Dijkstra's algorithm

II. Fill in the Blanks (5 × 1 = 5)

6. A linear list of elements in which deletion can done from one end front and insertion can take place only at the rear is known as _____

7. _____ technique used for finding similarity between two set.

8. In a max-heap, element with the greatest key is always in _____ node.

9. _____ is an application of Red-black trees.

10. The _____ is for solving the All Pairs Shortest Path problem.

III. Answer ALL questions. (5 × 2 = 10)

11. Define queue.

12. What is quadratic probing?

13. What is heap order property?

14. Distinguish between single rotation and double rotation.

15. Determine shortest path algorithm.

PART B — (5 × 5 = 25)

Answer ALL the questions, choosing either (a) or (b)

16. (a) List out the uses of linked list.

Or

(b) Write a short note on selection sort.

17. (a) Explain about double hashing and rehashing.

Or

(b) Describe hash tables without linked lists.