

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2023

M.Tech-I Semester (Data Science)

COURSE CODE(CREDITS): 22M11CI111(3)

MAX. MARKS: 25

COURSE NAME: Advanced Data Structures

COURSE INSTRUCTORS: Mr. Maneet Singh

MAX. TIME: 1 Hour 30 Minutes

*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

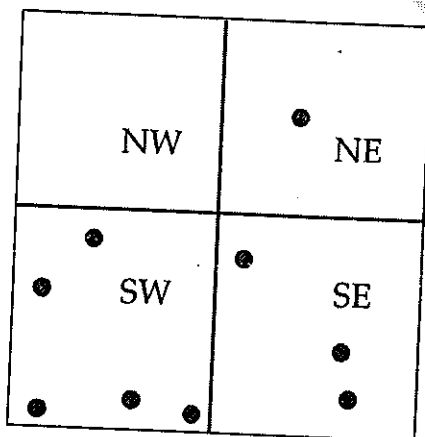
*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

Q1. What is the role of heap in priority queues? Briefly describe the process to implement Dijkstra's algorithm using Heap-based Priority Queue. [5] [CO4]

Q2. Explain Round-Robin Minimum Spanning Tree Algorithm in detail. Also specify the scenario where the algorithm could outperform traditional methods. [5] [CO4]

Q3. What are Elementary intervals? Explain the steps required to list all the intervals that contain the key 'k' in the subtree rooted at 'x'. [5] [CO2]

Q4. How are quad trees different from kd trees? Draw a quad tree for the following point sets:



[5] [CO2]

Q5. Describe the following data structures in detail:-

(a) Leftist heap

[2] [CO4]

(b) K-ary tree

[3] [CO2]