

GURUKULA KANGRI (DEEMED TO BE UNIVERSITY), HARIDWAR
END SEMESTER EXAMINATION-2021

CLASS – B. TECH

SEMESTER – V

SUBJECT NAME – ADVANCE DATA STRUCTURE

SUBJECT CODE – BCE-C512

TIME: 3 HOUR

MAX. MARKS: 70

MIN. PASS: 40%

NOTE: QUESTION PAPER IS DIVIDED INTO TWO SECTIONS A AND B. ATTEMPT BOTH SECTIONS AS PER GIVEN INSTRUCTIONS.

SECTION-A (SHORT ANSWER TYPE QUESTIONS)

INSTRUCTIONS: ANSWER ANY FIVE QUESTIONS IN ABOUT 150 WORDS EACH. EACH QUESTION CARRIES SIX MARKS. (5 X 6 = 30 MARKS)

- Q 1. What is pattern matching and indexing? Discuss with an example.
- Q 2. Bring out the differences of B+ and B trees.
- Q 3. What is a threaded binary tree? Describe its node structure.
- Q 4. Write the steps to perform efficient non recursive in-order traversal of a binary tree.
- Q 5. Implement a red black tree for the following data
- 13, 25, 46, 67, 89, 23, 34, 11, 65
- Q 6. Discuss the union find algorithm and its operations on disjoint sets.
- Q 7. Discuss Knuth-Morris-Pratt algorithm with an example.
- Q 8. Write the algorithm to implement Binomial heap.
- Q 9. Define articulation point and topological sort.
- Q 10. What do you understand by the term Isomorphism? Give examples.

SECTION-B (LONG ANSWER TYPE QUESTIONS)

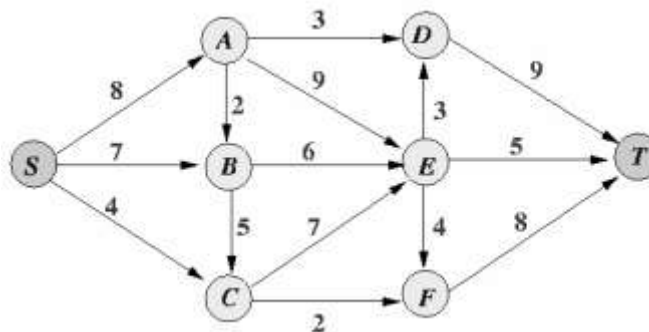
INSTRUCTIONS: ANSWER ANY FOUR QUESTIONS IN DETAIL. EACH QUESTION CARRIES TEN MARKS. (4 X 10 = 40 MARKS)

- Q. 1 How does a Search Engine work? Elaborate with an example.
- Q. 2 Create a threaded binary tree for first 8 characters and write the in order for the tree.
- Q. 3 Suppose we build the Huffman code tree for the set of letters and frequencies given below:

Character:	A	B	C	D	E	F	G
Frequency:	1	5	10	20	25	30	35

What will be the code for the character B?

- Q. 4 What are the operation on Mergeable Heaps? Discuss.
- Q. 5 Write short notes on (any two)
- i) Ford – Fulkerson Max Flow Algorithm
 - ii) Standard Tries
 - iii) Algorithm for Connectedness
 - iv) Depth first Search
- Q. 6 Define the Min Cut Max Flow theorem for Network and Find the Min cut for the following graph.



- Q. 7 Derive an algorithm to traverse all the nodes in a Red Black Tree.
- Q. 8 Discuss the properties of B* tree that make them more efficient in comparison with B+ trees and also implement a B* tree for the following data

24, 28, 13, 26, 19, 44, 53, 22, 28, 34, 38