

Q.3 Answer the following.

[16]

- A** Given an array of integers, write an algorithm to find the second largest element of the array using recursion. Present running time analysis of your algorithm. **(06)**

BL4

- B** Solve the following recurrence relations. **(10)**

CLO1 1) $T(n) = T(n/2) + n$ **BL3** 2) $T(n) = 9T(n/3) + n^2$ **SECTION - II****Q.4 Answer the following.**

[18]

- A** Find the optimal order of multiplying following matrices using dynamic programming approach (complete trace expected). $A_{\text{Total}} = A_1 A_2 A_3 A_4 A_5 A_6$ **(12)**

BL3 where $A_1: 2 \times 7$, $A_2: 7 \times 9$, $A_3: 9 \times 11$, $A_4: 11 \times 4$, $A_5: 4 \times 6$, $A_6: 6 \times 3$

- B** Write an algorithm to decrease the key of a node x in a Binomial heap **(06)**
CLO4 H to a new value k. Assume that k is not greater than x's current key.

BL2**Q.5 Answer the following.**

[16]

- A** Find longest common subsequence in given two strings A and B using dynamic programming approach (complete trace expected), where **(12)**

BL4 A=pqrspqrspq and B=pqpqpqaqp.

- B** “Greedy approach always gives an optimal solution for the given problem” – State True or False with a justification. **(04)**
CLO3

BL5**Q.6 Answer the following.**

[16]

- A** Write an algorithm for Huffman encoding using greedy approach. **(08)**
CLO4 Derive time complexity of your algorithm.

BL4

- B** Write Floyd’s algorithm to find the shortest path between every pair of vertices of a graph. Present running time analysis of the algorithm. **(08)**
CLO4

BL3