S.E. Com / Sem IV / Rev 10 June

1st-half-AGJ-10 (a) 28

Analysis of Algorithm & Design

Con. 3705-10. (REVISED COURSE) **AN-3454**

(3 Hours) **[Total Marks : 100**

N.B. (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from the remaining **six** questions.
(3) Assumption made should be **clearly** stated.
(4) Assume **suitable** data whenever **required**.

1. a) Write a routine to delete a word from a tries. 05

b) Write an algorithm to find the sum of series and also find its time complexity where , 05

$$S = \sum_{i=1}^{n} i^2$$

c) Compare Greedy method & backtracking method 05

d) What is recursion? Write a routine to calculate Fibonacci series using it. 05

2. a) Implement the binary search, prove that the complexity of binary search is $O(\log_2 N)$ 10

b) Explain randomized version of Quick sort and evaluate its complexity with example. 10

3. a) Explain with example job sequencing with deadlines. 10

b) Explain optimal storage on tapes with example. 05

4. a) Explain longest common subsequence with example. 10

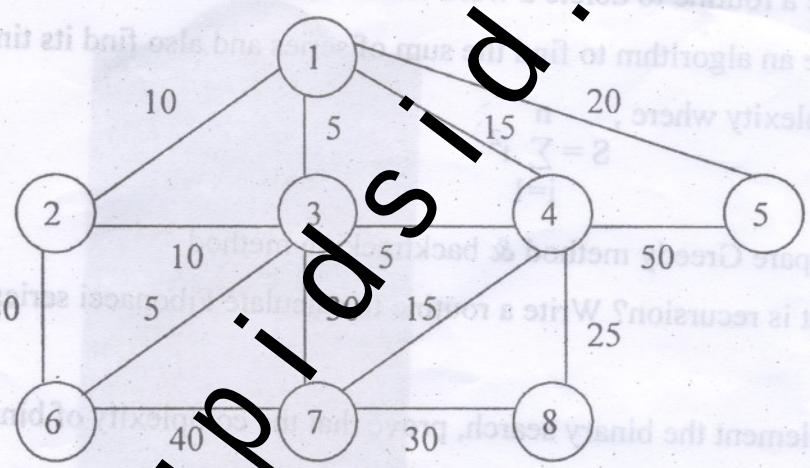
b) Write a note on all pairs shortest path algorithm. 10

5. a) Write & explain sum of subset algorithm, 10
with n=4, w={2,7,8,15}, m=17

b) Explain backtracking method to solve 0/1 knapsack problem. 10
Find solution for n=3, m=20
$(p_1, p_2, p_3) = (25, 24, 15)$ and $(w_1, w_2, w_3) = (18, 15, 10)$.

[TURN OVER

6. a) Find minimum cost spanning tree for the given graph figure, using Prim's & Kruskal's Algorithm:–



b) Explain how branch & bound method can be applied to solve 15 puzzle using least cost search.

7. a) Implement merge sort using divide & conquer strategy.

Sort the following numbers showing output of each pass.

100, 20, 38, 14, 48, 07, 17, 57, 93, 35

b) Find the Huffman code for the following set of frequencies based on the first 8 Fibonacci numbers.

a = 1, b = 1, c = 2, d = 3, e = 5, f = 8, g = 13, h = 21.