M. SC. (COMPUTER SCIENCE) SEM – I (CHOICE BASED CREDIT & GRADE SYSTEM) : SUMMER - 2018

SUBJECT: ALGORITHM DESIGN PATTERNS

Day : **Tuesday**
Date : **10/04/2018**

S-2018-0916

Time : **03.00 PM TO 06.00 PM**
Max. Marks : 60.

N.B.:

1) All questions are **COMPULSORY.**
2) Figures to the **RIGHT** indicate full marks.

Q.1 Describe branch and bound strategy in detail. Consider the following weighted graph and compute the optimal tour using traveling salesman problem. **(15)**

	1	2	3	4
1	0	10	15	20
2	5	0	9	10
3	6	13	0	12
4	8	8	9	0

OR

Elaborate Divide and Conquer strategy with 'D and C' algorithm. Illustrate 'maxmin' algorithm with appropriate example.

Q.2 **A)** Answer any **ONE** of the following: **(08)**

i) Find the Optimal ordering of programs
Let m = 3 and $\{d_1, d_2, d_3\} = \{5, 10, 3\}$.

ii) Write in detail about Analysis of Algorithm.

B) Answer any **ONE** of the following: **(07)**

i) Explain AND/ OR graphs in detail.

ii) Describe Flow Shop scheduling with an appropriate example.

Q.3 Answer any **THREE** of the following: **(15)**

a) Define space and time complexity.

b) Construct binary search tree for n = 8 with values
10, 12, 8, 11, 19, 9, 15, 14.

c) What is Cook's theorem? Give its proof.

d) Illustrate Prim's algorithm with example.

e) What is Knapsack problem? Write Greedy Knapsack algorithm.

Q.4 Write short notes on (Any **Three**) **(15)**

a) All pairs shortest path

b) Backtracking

c) Vertex coloring

d) N queen's problem

e) Non-deterministic algorithm.

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