M. SC. (COMPUTER SCIENCE) SEM – I (CHOICE BASED CREDIT & GRADE SYSTEM) : WINTER - 2017

SUBJECT: ALGORITHM DESIGN PATTERNS

Day: Tuesday | Time: 03.00 PM TO 06.00 PM

Date: 24/10/2017 | **W-2017-0816** | Max Marks: 60

N.B:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.

Q.1 Elaborate dynamic programming in detail. Also discuss 'n' queens problem in detail. **(15)**

OR

What is Huffman coding? Explain matrix chain multiplication.

Q.2 **A)** Answer any **ONE** **(08)**

i) Explain deterministic and non- deterministic algorithm in detail.

ii) What is greedy strategy? Discuss knapsack problem.

B) Answer any **ONE** **(07)**

i) Find the optimal tour for a given graph using Travelling Salesman Problem

$$a = \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \end{matrix} \begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$$

ii) Find out the optimal ordering TRT as well as ERT for the given programs and their lengths.
Given : n=3 and length of programs [l1,l2,l3]=[7, 3, 11]

Q.3 Answer any **THREE** **(15)**

a) Define- Hamiltonian path & cyclic graph.

b) Explain – matrix coloring & face coloring.

c) Write a DFS algorithm for an undirected graph.

d) Describe prim's algorithm to find minimum cost spanning tree with example.

e) Elaborate backtracking strategy in detail.

Q.4 Write short notes on (**ANY THREE**) **(15)**

a) Flow shop scheduling

b) Binary search using divide and conquer

c) Set theory

d) NP- hard problem

e) Algorithm analysis

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