Reg. No. ☐☐☐☐☐☐☐☐☐

Fourth Semester B.C.A. 3 Degree Examination, May/June 2018
DESIGN AND ANALYSIS OF ALGORITHMS
(Regular and Repeaters)

Duration : 3 Hours   Max. Marks : 80

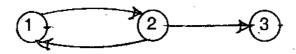***Instructions :*** *1) Write answer to the particular Section questions together.*
*2) Draw diagrams **wherever** necessary.*

PART – A

1. Solve **any ten** questions.   (10×2=20)

   a) State what do you mean by computational procedures with respect to algorithm.

   b) Algorithm forms the base to write a program for solution of a given problem. Justify.

   c) What is a program ?

   d) Give the pseudocode convention of for – next loop.

   e) Write control abstraction for Divide and Conquer (DAC).

   f) What do you understand by term analysis of algorithm ?

   g) What is feasible solution and optimal solution ?

   h) What do you mean by two way merge pattern ?

   i) For the graph given, state the indegree and outdegree of node '1' and '2'.

   j) Differentiate between directed graph and undirected graph. With neat diagram.

   k) Define Tree Traversal.

   l) What is explicit constraint ?

PART – B

Solve **any four** questions.   (4×5=20)

2. What are the characteristics expected in good algorithm ? Explain in brief.

3. Compare, Linear search and binary search methodology.

4. Using the Greedy Knapsack algorithm Find optimal solution for the following $n = 3$, $m = 24$, $(P_1, P_2, P_3) = (30, 28, 20)$ and $(W_1, W_2, W_3) = (21, 18, 12)$.

5. State the similarities and differences between divide and conquer technique and dynamic programming methodology.

6. State the two Graph search and traversal methods. Discuss Breadth First Search and Traversal with an example.

7. Explain the sum of subset problem. Find all the possible subsets of 'W' that sum to 'm' for the following $W = \{5, 7, 10, 12, 15, 18, 20\}$, $m = \{3, 5\}$.

PART – C

Solve **any four full** questions. **(4×10=40)**

8. What is the importance of expressing algorithm in pseudocode ? Explain various pseudocode conventions for specifying algorithm. **10**

9. a) Discuss subset paradigm and ordering paradigm with example. **5**

   b) In a job sequencing with deadline problem find all feasible solutions and then identify the optimal solution where $n = 4$, $(P_1, P_2, P_3, P_4) = (100, 10, 15, 27)$ and $(d_1, d_2, d_3, d_4) = (2, 1, 2, 1)$. **5**

10. a) Explain the flow shop scheduling problem with respect to

    i) Preemptive scheduling

    ii) Non-Preemptive scheduling. **5**

    b) Write a note on Travelling sales person problem. **5**

11. a) Draw a tree and describe the three tree traversal methods. **5**

    b) Draw the tree of recursive calls of Max Min for 'g' elements $a[1:9]$ 22, 13, –5, –8, 15, 60, 17, 31, 47. **5**

12. a) Explain Strassen's matrix multiplication wtih an example. **5**

    b) Write short note on **any one**. **5**

    i) 4 × 4 Queen's problem.

    ii) Hamiltonian cycle.