MCA-12

December - Examination 2015

MCA IInd Year Examination

Design and Analysis of Algorithm

Paper - MCA-12

Time : 3 Hours] **[Max. Marks :- 80**

Note: The question paper is divided into three sections A, B and C. Write answers as per given instructions.

Section - A 8 x 2 = 16

(Very Short Answer Questions)

Note: Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum upto 30 words. Each question carries 2 marks.

1) (i) What is disjoint sets?

(ii) Define the term back tracking.

(iii) List any two property of NP-complete problem.

(iv) How you find degree of a tree?

(v) What is optimal substructure?

(vi) Write three steps of divide and conquer algorithm.

(vii) What is reducibility?

(viii) What is flow chart?

Section - B

4 x 8 = 32

(Short Answer Questions)

Note: Answer **any four** questions. Each answer should not exceed 200 words. Each question carries 8 marks.

2) Compare Greedy Programming and Dynamic Programming with example.

3) Explain time and space complexity of Bubble sort with example.

4) Write a recursive function to sort elements using merge sort.

5) Explain briefly Big oh Notation, Omega Notation and Theta Notation. Give example.

6) What is graph colouring problem? What is the bounding condition for graph colouring problem?

7) Write short note on approximation algorithm for NP-Hard problem.

8) Sort the following element by using Heap sort algorithm

   17, 18, 5, 1, 8, 14, 6, 3, 10

9) Discuss flow shop scheduling with example.

Section - C

2 x 16 = 32

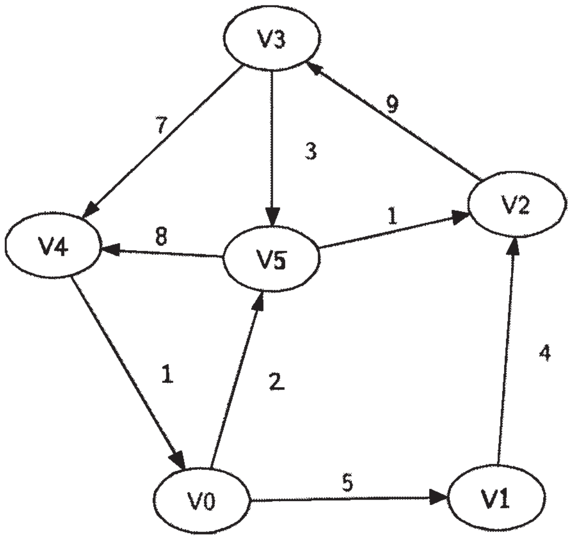
(Long Answer Questions)

Note: Answer **any two** questions. You have to delimit your each answer maximum upto 500 words. Each question carries 16 marks.

10) Differentiate between merge sort and quick sort with example.

11) Explain various searching algorithms in contrast with its complexity. Also give appropriate example.

12) Implement Dijkstra algorithm to implement shortest path for the following graph.



13) Apply and explain the backtracking method to solve the following:

(i) Hamiltonian circuit problem

(ii) Sub-set problem