Government College of Engineering, Aurangabad
(An Autonomous Institute of Government of Maharashtra)
T.E (CSE) Examination
End Semester Examination Nov 2016
CS 342: Design and Analysis of Algorithm

Time: Three Hours 15 NOV 2016 *Max. Marks: 60*

"Verify the course code and check whether you have got the correct question paper"

N.B.:-

1. ***All questions are compulsory***
2. ***Assume suitable data if necessary and state it clearly***
3. ***Use of non-programmable calculator is allowed***

Q1: Solve any two of the following **12 M**

A] Write an algorithm for merge sort and sort the following elements and find its Complexity

310 285 179 652 351 423 861 254 450 520

B] Explain the asymptotic notations with examples.

C] Write a recursive algorithm for binary search and trace the action of *BinarySearch,* including listing the values of Low, High and Mid after each iteration, for the list

-3,-4,5,7,11,16,17,19,23,29,31,37

for Searching element X = 59

Q2: Solve the following **12 M**

A] Explain the Flow shop scheduling and explain the possible schedules for the following matrix

$$\begin{bmatrix} 2 & 0 \\ 3 & 3 \\ 5 & 2 \end{bmatrix}$$

B] Find an optimal solution to the knapsack instance
n=7, m= 15 ,

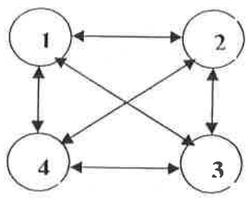
(p1,p2,.....,p7) = (10,5,15,7,6,18,3) and

(w1,w2,.....w7)= (2,3,5,7,1,4,1)

Q3: Solve the following **12 M**

Explain TSP using dynamic programming.

Find optimal cost tour for the following directed graph



1	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

Q4: Solve any two of the following **12 M**

A] What do mean by state space in backtracking? Draw the state space tree for 4 queen problem.

B] What is the use of sum of subset in backtracking?
Let weight vector (10, 25, 5, 10) and m = 25.
Find all possible subsets of weight that sum to m and draw the portion of the state space tree that is generated.

C] Write an algorithm for all pair shortest path. Explain with suitable example.

Q5: Solve any two of the following **12 M**

A] Write an algorithm for postorder traversal.

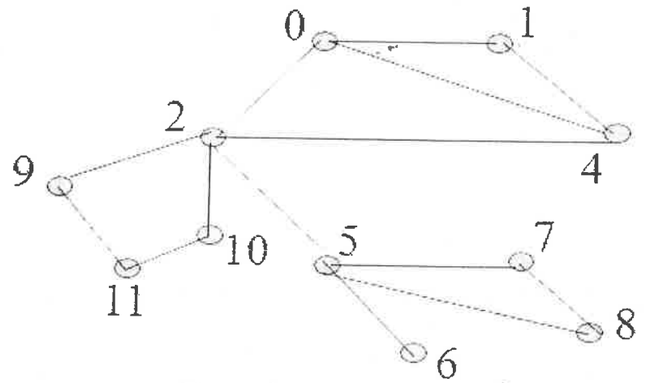
The following sequence gives the postorder of the binary tree T

G D B H I E F C A

Draw the diagram of the tree (Stepwise) .

B] Explain the graph coloring with map and its planer graph representation.

C] Explain BFS . Illustrate the BFS for following Graph G from node 0



Graph G