

DHARMSINH DESAI UNIVERSITY
FACULTY OF TECHNOLOGY
B.E SEM V CE/IT
THIRD SESSIONAL EXAM
SUBJECT: DESIGN AND ANALYSIS OF ALGORITHM

DATE:16/10/2012
Time: 11.15 to 12.30

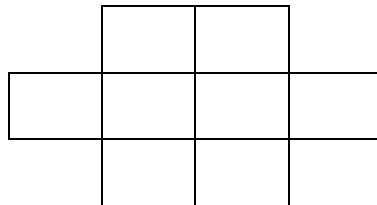
MAX MARKS:36
SEAT NO : _____

Q1 Answer The following questions:

- a) Compare backtracking with Branch and bound method. Give an example in which backtracking is more suitable than branch and bound. [2]
- b) Give difference between FIFO branch and bound and LC search branch and bound. Is there any difference in efficiency if you choose one over the other for a specific problem. [2]
- c) What is your justification for the question "Is P is a proper subset of NP" ? [2]
- d) Compare Deterministic and Non Deterministic Algorithms. [2]
- e) List out implicit and explicit constraints of 8-Queen problem and sum of subset problem. [2]
- f) Define the terms : Live node, E node and Dead node. Also explain what is the difference in E node of backtracking and E node of Branch and bound. [2]

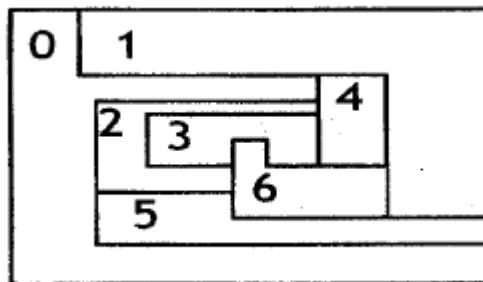
Q2 Answer any two.

- a) Allocate the integers from 1 to 8 to the squares in following figure such that no two adjacent squares (vertical, diagonal and horizontal) contains consecutive integers. [6]



Write a suitable algorithm to find adjacent squares of a square.

- b) Color the given map with 3 colors using **backtracking** technique. Also explain the algorithm. Use Variable tuple size formulation. [6]



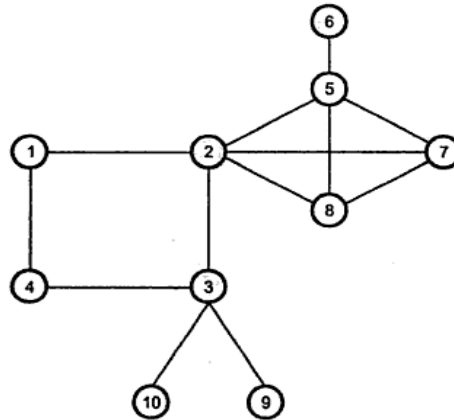
- c) Let $w = \{5, 7, 10, 12, 15, 18, 20\}$ and $m = 35$. Solve sum of subset problem using **backtracking** technique. Use fixed tuple size formulation. [6]

Q3 Answer the following questions

- a) Use **branch and bound** to solve the assignment problem with the following cost matrix: [6]

	1	2	3	4
a	94	1	54	68
b	74	10	88	82
c	62	88	8	76
d	11	74	81	21

- b) Decide the articulation points and bi- connected components for the graph given below. [6]



OR

Q3 Answer the following questions

- a) Find the optimal tour for TSP for 5 cities using **branch and bound** method. Cost matrix is given below. [6]

	a	b	c	d	e
a	∞	7	3	12	8
b	3	∞	6	14	9
c	5	8	∞	6	18
d	9	3	5	∞	11
e	18	14	9	8	∞

- b) Solve the following problem using **branch and bound** method: "Given n objects and a knapsack with capacity W=10 kg. Fill the knapsack with the objects such as to maximize the total value." [6]

i	1	2	3	4
v_i	10	40	30	50
w_i	5	4	6	3