

18/5/13

12

END SEMESTER EXAMINATION – APR 2013  
BE INDUSTRIAL ENGINEERING (FT) – V SEMESTER  
IE 9029 COMPUTATIONAL METHODS ALGORITHMS  
(REGULATION 2008)

Time: 3 Hours

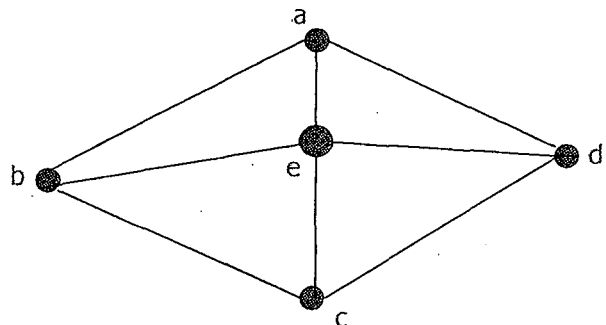
Max Marks: 100

ANSWER ALL THE QUESTIONS

Part A

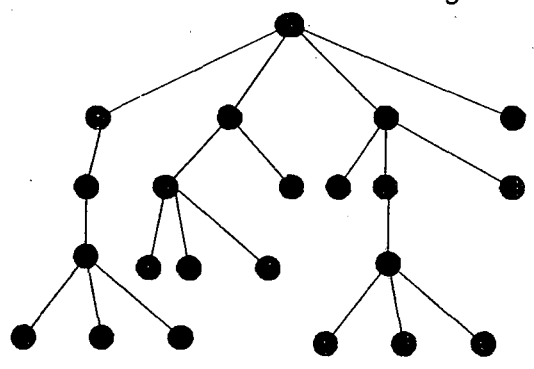
(10 X 2 = 20 Marks)

1. Give the Chapin chart to determine the maximum value of an array of size n.
- 2.



Identify and list the following for the above net work

- a. Maximum Degree
  - b. End vertices
  - c. Cut Vertex &
  - d. Bridge
3. State all the characteristics of the following network.



4. What is sub goal in algorithm design? Give an example.
5. Assume that push down structure is used to check order of the following pairs of symbols  
[[{(())]]  
Show the contents of the stack after reading each symbol.
6. Give any four IE oriented techniques that employ Hill climbing methodology.
7. Give a recursive program to compute the factorial of a given number.
8. What is meant by heuristics?
9. What is mutation in GA?

10. It is required to sort the following array in ascending order using bubble sort.

23	34	12	45	56
----	----	----	----	----

Show the step-by-step progress.

**Part B**  
**(5 X 16 = 80 Marks)**

11. State and explain the major steps involved in the design of algorithms.
- 12a. Give the algorithm and the corresponding program to convert the adjacency matrix of a net work into its incidence matrix and to list the degree of each vertex.

**(OR)**

- 12b. Given the adjacency matrix of a tree, give the algorithm and program to check whether the given tree is a binary tree.
- 13a. Dequeue is a type of queue that allows insertion and deletion from both ends of the queue. Give the algorithm and the corresponding program to add and delete elements from a dequeue.

**(OR)**

- 13b. The following table gives the processing times of four jobs on four machines and it is required to assign the jobs to machines so as to minimise the total processing time.

	Job 1	Job 2	Job 3	Job 4
M/c 1	6	5	8	3
M/c 2	10	5	4	15
M/c 3	13	7	2	11
M/c 4	13	9	7	10

Solve the assignment problem using branch and bound method.

- 14a. What is a linked list? Give the detailed algorithm to read information from a linked list.

**(OR)**

- 14b. Write short notes on
- Double linked list
  - program efficiency
  - Arrays

- 15a. Explain in detail Genetic algorithm methodology with a suitable example.

**(OR)**

- 15b. Give the step by step procedure of Simulated annealing technique.