

This question paper contains 4 printed pages]

**BJ—586—2014**

**FACULTY OF ENGINEERING**

**S.E. (CSE) EXAMINATION**

**MAY/JUNE, 2014**

**(New Course)**

**COMPUTER ALGORITHMS**

**(Saturday, 21-6-2014)**

**Time : 10.00 a.m. to 1.00 p.m.**

*Time—Three Hours*

*Maximum Marks—80*

*N.B. :— (i) All questions are compulsory.*

*(ii) Assume suitable data, if necessary.*

*(iii) Figures to the right indicate full marks.*

**Section A**

1. Solve any two :

2×6=12

(a) State and explain Master theorem.

(b) Write an algorithm of insertion sort and sort the given array :

$A = \{5, 2, 4, 6, 1, 3\}.$

(c) Explain the role of algorithms in computing.

P.T.O.

2. Solve any two :

2×7=14

- (a) Explain the elements of dynamic programmings.
- (b) Determine upper bound for :

$$T(n) = 2T(n/2) + n.$$

Verify solution using substitution method.

- (c) Compare divide and conquer method and dynamic programming.

3. Solve any two :

2×7=14

- (a) Determine LCS of {1, 0, 0, 1, 0, 1, 0, 1} and {0, 1, 0, 1, 1, 0, 1, 1, 0}.
- (b) Write an algorithm for MAX\_HEAP\_INSERT and HEAP\_INCREASE\_KEY.
- (c) Explain disjoint set operations with application.

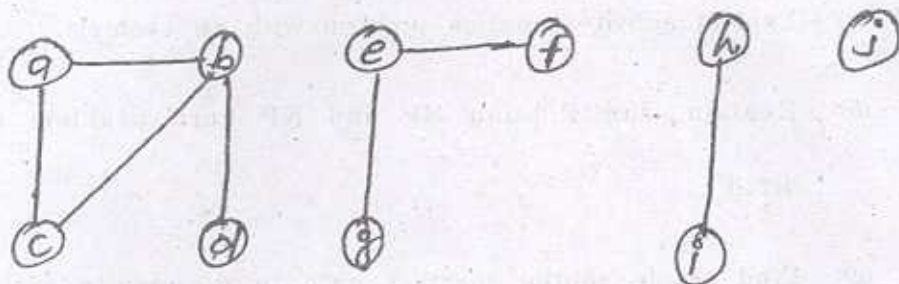
### Section B

4. Solve any two :

2×6=12

- (a) Explain Assembly line problem with an example.
- (b) Compare Greedy method Vs. Dynamic programming. Which is more efficient ? Explain with an example.

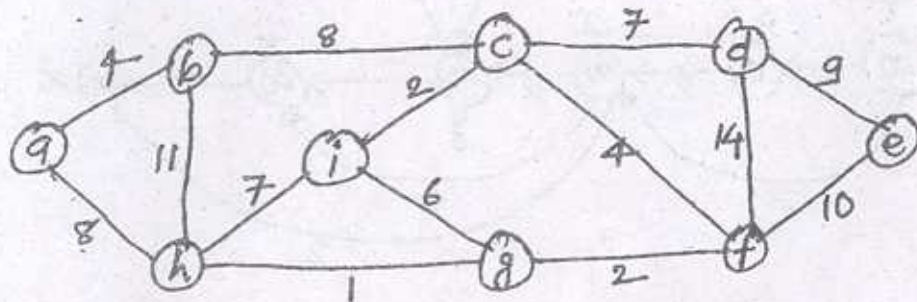
- (c) Find connected component for undirected graphs :



5. Solve any two :

2×7=14

- (a) Construct MST using Kruskal's for the following graph :



- (b) Write Bellman-Ford algorithm.  
 (c) Find the Huffman codes for the following set of sequences :

$a : 1, b : 1, c : 2, d : 3,$

$e : 5, f : 8, g : 13, h : 21.$



6. Solve any two :

2×7=14

- (a) Explain activity selection problem with an example.
- (b) Explain class P, class NP and NP hard problem in detail.
- (c) Find single source shortest path in directed a cyclic graph.

