Reg. No. | | | | | | | | | | | | |

Question Paper Code : 27293

5 Year M.Sc. DEGREE EXAMINATION, MAY/JUNE 2016

First Semester

Software Engineering

ESE 013 – PROBLEM SOLVING TECHNIQUES

(Common to 5 Year M.Sc. Software Systems)

(Regulations 2010)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Name the important factors that affect the efficiency of algorithms.

2. What is redundant computation ? Give an example code segment.

3. Differentiate between GCD and LCM ?

4. What is meant by histogramming ?

5. Compare binary search and hash search.

6. Write an algorithm to sort an array into descending order.

7. List the applications of queue.

8. Define Binary Tree.

9. Design a recursive tree insertion algorithm.

10. Write down the iterative algorithm to solve the Towers of Hanoi problem.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Discuss the steps involved in problem solving. **(8)**

(ii) Design an algorithm that converts a decimal to octal representation. **(8)**

OR

(b) (i) Explain the procedure of top-down design of an algorithm. **(8)**

(ii) With the help of suitable code explain the procedure in computing a factorial of a number. **(8)**

12. (a) (i) Explain the procedure of generating a prime number with an example. **(8)**

(ii) How will you remove the duplicates from an ordered array ? Explain with an example. **(8)**

OR

(b) (i) Briefly give a note on computing procedure for the prime factor of an integer. **(8)**

(ii) Discuss the procedure involved in finding the kth smallest element from a randomly ordered array of n elements. **(8)**

13. (a) (i) Explain the two-way merge sort technique for merging two ordered arrays in ascending order. Also develop the corresponding algorithm. **(8)**

(ii) Explain in detail the binary search. **(8)**

OR

(b) (i) Explain the selection sort algorithm in detail with an example. **(8)**

(ii) Design a procedure for "Right and left justifying" of a text without splitting the words and briefly explain. **(8)**

14. (a) (i) A dequeue is a linear list that allows insertions and deletions at – both ends. Write procedures for maintaining a dequeue. **(12)**

(ii) Design a list searching algorithm that incorporates a sentinel. **(4)**

OR

(b) (i) Design an algorithm to search an ordered binary tree for a given alphabetic name. Describe the algorithm with example. **(8)**

(ii) Construct binary tree for the given values. Write down the insertion procedure. **(8)**

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15. (a) (i) Explain about Recursive Quick Sort. **(8)**

(ii) Give the algorithm for Quick Sort. **(8)**

OR

(b) Explain the recursive algorithms for Binary Tree Traversal. **(16)**
