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Question Paper Code : 95293

5 Year M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

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. Write any four quality of an algorithm.

2. What is the need for program verification?

3. Define prime number. Give an example.

4. Give the algorithm for finding the square root of a number by factoring method.

5. What is an exchange sort?

6. Compare binary search and hash search.

7. Define queue.

8. Write down the applications of stack.

9. Define Tower of Hanoi problem.

10. Write non-recursive algorithm for inorder traversal of an ordered binary tree.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the various phases involved in problem solving. (10)

(ii) How to test the efficiency of an algorithm? Explain with an example. (6)

Or

(b) (i) Explain top-down design of algorithm with an illustration. (10)

(ii) Explain the counting algorithm with an example. (6)

12. (a) (i) Design an algorithm to find the minimum and maximum elements in an array of *n* elements. (12)

(ii) Using the factoring technique, find the GCD of two numbers. (4)

Or

(b) (i) Write a pseudo code to design the removal of duplicates from an ordered array with example. (8)

(ii) Write an algorithm to find the K^{th} smallest element in an array having *n* elements with example. (8)

13. (a) Explain the following in detail :

(i) Sort by partitioning (8)

(ii) Text line editing. (8)

Or

(b) (i) Write the pseudo code for diminishing incrementing sort. (8)

(ii) Briefly explain the two-way merge sort. (8)

14. (a) Explain the following operations on a binary tree using suitable example. (16)

(i) Find a node

(ii) Insert a node

(ii) Delete a node.

Or

(b) (i) What is a stack? Explain the various operations performed on a stack with suitable examples. (10)

(ii) Highlight the salient the features of linked list. (6)

15. (a) Design a recursive procedure for inorder, preorder and postorder traversals of an ordered binary tree with suitable example. (16)

Or

(b) Explain the recursive version of a quick sort algorithm and sort the following numbers using quick sort procedure. (16)

20, 35, 8, 18, 14, 41, 3, 39.