

Reg No :

Question Paper Code : 72802

5 Years M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014

First Semester

Software Engineering

XCS 115 /10677SW105 – PROBLEM SOLVING TECHNIQUES

(Common to 5 Year M.Sc. Computer Technology and M.Sc. Information Technology)

(Regulation 2003 / 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A – (10 x 2 = 20 marks)

1. Define an algorithm.
2. Why is problem analysis important?
3. What is an array?
4. Write an algorithm to find the biggest of two numbers
5. Mention any four popular sorting algorithms
6. What is searching?
7. What are the two operations performed over stack?
8. Write a note on queue operation
9. What is recursion?
10. Whether tree is a linear/non-linear data structure? Justify your answer.

PART B – (5 x 16 = 80 marks)

11. (a) Discuss various problem solving methods with suitable illustrations.

Or

- (b) Explain factoring methods and write an algorithm to find the greatest common divisor of two numbers

12. (a) (i) What is a square root of a number ? Devise an algorithm for computing the square root of a number. (8)
- (ii) What is a prime number? Develop an algorithm for finding the prime numbers in a given range. (8)
- Or
- (b) (i) Develop an algorithm to find the duplicate element in an array. (8)
- (ii) Develop an algorithm to generate Fibonacci numbers in a given range (8)
13. (a) Discuss two way merge sorting algorithm with an example.
- Or
- (b) What is binary search? Discuss the binary search algorithm with an example
14. (a) What is a tree ? Discuss the various operations like insertion, deletion in a binary tree.
- Or
- (b) What is a linked list? Discuss the advantages over arrays and explain the various linked list operations.
15. (a) Discuss the advantages of recursion over iteration and explain recursion with Towers of Hanoi problem.
- Or
- (b) Discuss the recursive quick sort algorithm with an illustration.