Roll No ...

IC1535

M.Sc. (Informatics) 3rd Semester, 2012

Paper: IT-35- Software Engineering -I

Please write your Roll No on question paper after receiving it from Invigilator

Time allowed: 03 Hrs

Maximum Marks: 75

Note: Answer any five questions in all.

Q1 (a) Explain and Discuss different Software life cycle models like Waterfall model, V model, incremental model , RAD model, Iterative model and Spiral model in terms of their impact of selection on the different phases of software development for example testing that is carried out. Also, compare their selection in terms of Project constraints. 6

(b) Explain and Compare different models of specifying Requirements like (i) Formal specification (ii) Algebraic specification (iii) Decision tree (iv) Axiomatic specification. 6

(c) What are responsibilities of System Analyst. 3

Q2 (a) Define cohesion and coupling ? What are the different types of Cohesion and Coupling? Explain with examples 4

(b) Compare Basic and Intermediate CoCoMo model and show variation of efforts and development time in respect to size. Assume that the size of an organic type software product has been estimated to be 50,000 lines of source code. Assume that the average salary of software engineers be Rs. 20,000/- per month. Determine the effort required to develop the software product and the nominal development time. 5

(c) Describe Halstead's Software metrics. Also, give their three advantages and three disadvantages. 4

(d) Explain architectural design of a software with example. 2

Q3 (a)Compare Jelinski &Moranda model and Littlewood &Verall's model for software reliability growth. 5

(b) How Statistical testing may be used for software reliability. Give its advantages and disadvantages. 5

(c) Using critical path method for project scheduling, define (i)earliest start (ES) (ii) Latest start (iii) Earliest finish time (iv) Latest Finish (v) Minimum Time with example 5

Q4 (a) Suppose you have estimated the normal development time of a moderate-sized software product to be 5 months. You have also estimated that it will cost Rs. 50,000/- to develop the software product. Now, the customer comes and tells you that he wants you to accelerate the delivery time by 10%. How much additional cost would you charge the customer for this accelerated 9

delivery? Irrespective of whether you take less time or more time to develop the product, you are essentially developing the same product. Why then does the effort depend on the duration over which you develop the product?

(b) Describe the necessity of software configuration management. What are the controlled, precontrolled, and uncontrolled objects under configuration configuration identification. List typical controllable objects. 6

Q5 (a) Draw the Flow Graph for following "Binary Search" procedure 10

```
public int binarySearch(int sortedArray[ ], int searchValue)
{ int bottom = 0; int top = sortedArray.length – 1;
   int middle, locationOfsearchValue;
  boolean found = flase; locationOfsearchValue = -1;
  while ( bottom <= top && !found)
{    middle = (top + bottom)/2;
     If (searchValue == sortedArray[ middle ])
     {   found = true;
         locationOfsearchValue = middle;
     }
     else if (searchValue < sortedArray[ middle ])
           top = middle - 1;
     else bottom = middle + 1;
}
 return locationOfsearchValue; }
```

Also, give cyclomatic complexity and test case suit for above procedure.

(c) Consider following Risk parameters for a project under development in a company: Inadequate Project Planning Poor scope definition, Absence of Leadership, Poor cost estimates, Poor time estimates. Give the Contingency plan using any of Risk Monitoring and Control method. 5

Q6 (a) Give two examples in which black-box testing might give the impression that "everything is okay" , while white-box testing might uncover an error. Give two examples where white-box testing might give the impression that "everything is okay" , while black-box testing might uncover an error. 4

(b)The program computes the intersection point of two straight lines and displays theresult. It reads two integer pairs (m1, c1) and (m2, c2) defining the two straight lines of the form y=mx + c. Give possible test cases using Equivalence testing. 2

(c) Explain with examples qualitative and quantitative risk assessment. 5

(d) Define Mutation testing and Mutation score for a test case suit with example. 4