2014

Software Engineering & TQM

Time Allotted : 3 Hours *Full Marks : 70*

The figure in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: 10x1=10

   A. The entity relationship diagram
      a) Depicts relationships between data objects
      b) Depicts functions that transform the data flow
      c) Indicates how data are transformed by the system
      d) Indicates system reactions to external events
      e) Depicts the physical design of the data.

   B. Which of the following is not a step in the Requirements Engineering Process?
      a) Requirements Specification b) Requirements Analysis.
      c) Feasibility Study. d) Requirement Prioritization.

   C. The relationship between a derived class(or subclass) and base class is referred to as
      a) Association b) Inheritance
      c) Polymorphism d) Instantiation e) Aggregation.

   D. A design is said to be a good design if the components are
      a) Strongly coupled b) Weakly cohesive
      c) Strongly coupled and Weakly cohesive

d) Strongly coupled and strongly cohesive
e) Strongly cohesive and weakly coupled.

E. The degree of interaction between two modules is known as
a) Cohesion b) Strength c) Inheritance
d) Coupling e) Instantiation.

F. Build and Fix model has?
a) 3Phases b) 1Phases c) 2Phases d) 4Phases

G. In Intermediate COCOMO the mode that represents complex products is referred to as
(a) Embedded (b) Semidetached
(c) Organic (d) Multiplicative (e) Monolithic

H. Which of the following is not the guiding principle of software project scheduling?
(a) Compartmentalization (b) Market assessment
(c) Time allocation (d) Effort validation
(e) Interdependency

I. What do you call, when the elements of a module, all operate on the same data?
a) Functional cohesion b) Temporal cohesion
c) Procedural cohesion d) Communicational cohesion
e) Coincidental cohesion.

J. Softwares Science bases its estimation of the size of a product on
a) Files(Fl), Flows (F1) and Processes C(Pr)
b) Lines of Code (kLOC) c) Function Points (FP)
d) operands and operators e) Feature Points (FeP)

Group-B

(Short Answer Type Questions)

Answer any *three* of the following: 3x5=15

2. Identify the definite stages through which a software product under goes during its life time and explain the problems that might be faced by an organization if it does not follow any software life cycle model. 2+3

3. What is Mutation Testing? Explain why boundary value analysis is so important for the design of black box test suite for a problem. 2+3
4. Represent the following relations among classes using UML diagram.
   a) An order consists of one or more items. Each order item contains the name of the item, its quantity and the date by which it is required. Each order item is described by an item type specification object having details such as its vendor addresses, its unit price and the manufacturer.
   b) Bill contains number of items. Each item describes some commodity, the price of unit, and total on this price. 3+2
5. Differentiate PERT & Critical Path Method. What do you mean by crashing of a project? 5
6. Point out the major short comings of Lines of Code(LOC) metric in order to use it as a software project size metric.? What is the necessity of a feature point metric in the context of software project size estimation? 3+2

Group-C
(Long Answer Type Questions)
Answer any *three* of the following: 3x15=45

7. a) Identify six different phases of a classical Waterfall model. Mention at least two reasons as to why classical waterfall model can be considered impractical and can not be used in real projects.
   b) What is a software prototype? Identify three reasons for the necessity of developing a prototype during software development.
   c) Write down the two advantages of using spiral model. 3+3+5+4
8. a) Identify four characteristics of a good software design technique.
   b) Consider Library Membership Automation Software(LMS) where it should support the following three options: New member, Renewal, Cancel membership. Design the Decision tree and Decision table of the above mentioned problem.
   c) Document the functional requirement of the withdraw cash

function of an ATM. 4+6+5

9. a) What is software metric? Find the estimated length and volume of the following C program:

```
Main()
{
int a,b,c,avg;
scanf("%d%d%d",&a,&b,&c);
avg=(a+b+c)/3;
printf("avg =%d",avg);
}
```

   b) Assume that the size of an organic type software product has been estimated to be 32,000 lines of source code. Assume that the average salary of software engineers be Rs. 15,000/-per month. Determine the effort required to develop the software product, the nominal development time and the cost.

   c) What do you mean by crashing of a project? Give an example. 5+6+4

10. a) What is software maintenance? Describe various categories of maintenance. 8

   b) Compute the function point value for a project with the following information domain characteristics.

   Number of user inputs=30

   Number of user outputs=42

   Number of user enquiries = 08

   Number of files=07

   Number of external interfaces = 06

   Assume that all complexity adjustment values are moderate. 7

11. Write short notes on any *three* of the following: 3x5

   a) Reverse Engineering

   b) COCOMO-II Model

   c) CMM levels

   d) Computer Aided Software Engineering (CASE)

   e) Software Requirement Specification

____x-x-x____