

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2475

Roll No.

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B.Tech.

(SEMESTER-VI) THEORY EXAMINATION 2012-13

SOFTWARE ENGINEERING

Time : 3 Hours ]

[ Total Marks : 100

SECTION - A

1. Attempt all parts :

10 × 2 = 20

- (a) List any two basic characteristics that differentiate a simple program from a software product.
- (b) Why Spiral model is called a meta model ?
- (c) State any two problems that may arise during requirement analysis.
- (d) Briefly explain the review process of quality assurance.
- (e) Differentiate between a Software measure and a Software metric.
- (f) Explain briefly the concept of modularity in terms of software design with suitable example.
- (g) Which approach is better for testing software components-Bottom-Up or Top-Down ?
- (h) What is testability ?
- (i) Give any two reasons for increase in the software costs.
- (j) Justify the statement: "Maintenance is unavoidable in software systems".



## SECTION - B

2. Attempt any three parts.

3 × 10 = 30

- (a) What is the main aim of feasibility study in a software development life cycle ? Explain the activities undertaken during feasibility study. Explain with the help of an example case study.
- (b) For building a web based library management system for an organization :
- (i) Develop an entity relationship diagram that describes data objects, relationships and attributes.
  - (ii) Develop a context-level model for the system.
  - (iii) Develop a level-1 DFD for the system.
- (c) Draw a flow graph, arrive at the cyclomatic complexity and find the set of linearly independent paths for the following program :

```
void F(int key, int T[ ], int size, boolean found, int L)
{
    int bot, top, mid;
    bot=0;
    top=size-1;
    L=(top+bot)/2;
    if(T[L] == key) found = true;
    else
        found = false;
    while (bot<=top && !found)
    {
        mid=(top+bot)/2;
        if(T[mid] == key )
        {
            found = true; L=mid;
        }
        else if (T[mid] < key )
            bot = mid + 1;
        else
            top = mid - 1;
    }
}
```

(d) Differentiate between the following :

- (i) Testing and debugging.
- (ii) Stubs and Drivers.
- (iii) Alpha and Beta Testing.
- (iv) Stress and Security Testing.

(e) Describe the relevance of CASE tools in software engineering. Which phase of SDLC you can take help of CASE tools ? Name few CASE tools used in any SDLC.

### SECTION – C

Attempt all parts. :

5 × 10 = 50

3. Attempt any two parts :

- (a) Explain the following statement : “Software Engineering is a layered technology”.
- (b) Mention reasons as to why classical waterfall model can be considered impractical and cannot be used in real projects.
- (c) List factors that have contributed to the making of the present software crisis. Suggest at least two possible solutions to the present software crisis.

4. Attempt any two parts :

- (a) List five salient requirements that a software development organization must comply with before it can be awarded the ISO 9001 certificate.
- (b) Explain how the requirement process converts the client needs to validated Software Requirement Specification (SRS).
- (c) In a software development organization, identify the persons responsible for carrying out the quality assurance activities. Explain the principal tasks they perform to meet this responsibility.

5. Attempt any two parts :

- (a) What do you mean functional independence ? Why functional independence is the key factor for a good software design ? Explain.
- (b) Explain the following statement: "The degree of coupling between two modules depends on their interface complexity".
- (c) Using a suitable example, explain how Halstead's software science is used to measure size, development effort and development cost of software products.

6. Attempt any two parts.

- (a) Explain briefly any five coding standards one should follow. Use suitable examples.
- (b) Design a black-box test suite for a program that computes the intersection point of two straight lines and displays the result as "Parallel lines"/ "Intersecting lines" / "Coincident lines". It reads two integer pairs  $(m_1, c_1)$  and  $(m_2, c_2)$  defining the two straight lines of the form  $y=mx + c$ . The lines are Parallel if  $m_1= m_2, c_1 \neq c_2$ ; intersecting if  $m_1 \neq m_2$ ; and Coincident if  $m_1=m_2, c_1=c_2$ .
- (c) Discuss Walkthroughs and Inspections as Software Review Techniques.

7. Attempt any two parts :

- (a) What are legacy systems ? Why do they require re-engineering ? Describe briefly the steps required for re-engineering a software product.
- (b) What is software maintenance ? Describe various categories of software maintenance. Which category consumes maximum effort and why ?
- (c) Discuss the different categories of software development projects according to the COCOMO estimation model.