

### B3.3-R4: SOFTWARE ENGINEERING & CASE TOOLS

**NOTE:**

1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

**Time: 3 Hours**

**Total Marks: 100**

**1.**

- a) List and explain various phases of Software Development Life Cycle with their efforts which are required to be put in, in each phase percentage wise.
- b) What are cohesion and coupling in modular design? How are they different from each other?
- c) Give reasons of why software engineering is different from and harder to manage than other engineering discipline.
- d) Discuss how software quality can be achieved during software development. Is it possible to assess quality of software before the programs are actually developed?
- e) Anticipate different levels of KPAs in the context of SEI CMM.
- f) Briefly explain the aims of Software Reliability? How Reliability and Software Quality aspects are related? Why is it difficult to accurately quantify the Reliability of a Software Product?
- g) Define the term error, bug, fault and failure and describe how they are related to each other.

**(7x4)**

**2.**

- a) What is the meaning of Prototype in System development? Describe its use in application prototyping? Differentiate between evolutionary and throw-away prototypes.
- b) Define the term Computer Aided Software Engineering (CASE). Describe the types and advantages of CASE tools.
- c) What is data flow analysis in analysis? What is the significant of DFD in analysis modeling?

**(6+6+6)**

**3.**

- a) What is objective of User-Interface design? List and explain standard guideline for GUI design.
- b) What are the five software configuration management tasks? Define and discuss each of them.
- c) What is software maintenance? Why software maintenance is much more complex than hardware maintenance?

**(8+6+4)**

**4.**

- a) What can you make out as a newly approached client, if the approaching software company is currently at CMM Level 4 and has an ISO 9001 certification.
- b) Why is it advantageous to detect defects during code inspection than to detect these during testing? Briefly explain how code inspection can be carried out.
- c) Distinguish between Software Verification and Software Validation. When during Software Development life cycle they are patch? Can one be used in place of other? Justify your answer.

**(6+6+6)**

5.

- a) What is a Function Point? How the software size for the application can be estimated in function points? Also using FP count, how the efforts can be estimated provided various productivity means are given.
- b) Why object oriented techniques are needed for the development of the software? List out the different types of UML Diagrams used during the various phases of Software Development Life Cycle (SDLC). Also explain with examples in detail about all the UML diagrams that represent only the dynamic aspects of the software system with example.
- c) Why software is inherently complex? Briefly explain the structure of complex software. Define object model. Explain the various elements of object model in details.

**(4+8+6)**

6.

- a) What is the difference between code inspection and code walkthrough? Briefly explain the types of errors that are expected to be detected in each.
- b) "Many people believe that the only way in which the order of magnitude and improvements in software quality and productivity will be achieved is through component based development". Is this statement true? Explain.
- c) What is the aim of *testing*? Which are the methodologies (techniques) of *testing*? Which are the levels of Testing? Who will perform it?

**(4+6+8)**

7.

- a) Differentiate between Test Case and Test Suite. How are they related with test data? How to prepare the test case and to design an optimal test suite for any application?
- b) UML: is it a process, method or notation? How many models are there in UML? Is it possible to use UML for user interface design?
- c) What is the difference between a revision and a version? What do you mean by version control? Why is version control required? How can version control be achieved?

**(6+6+6)**