**Professional Course Examination (Odd), 2023**

( 5th Semester )

**BACHELOR OF COMPUTER APPLICATIONS**

Course No. : BCA/5/CC/25

**( Software Engineering—I )**

( Revised )

*Full Marks* : 75

*Time* : 3 hours

*The figures in the margin indicate full marks for the questions*

**( PART : A—OBJECTIVE )**

( *Marks* : 25 )

SECTION—I

( *Marks* : 15 )

**I.** Tick (✓) the correct answer in the brackets provided : 1×10=10

1. As the reliability increases, failure intensity

   *(a)* decreases ( )

   *(b)* has no effect ( )

   *(c)* increases ( )

   *(d)* None of the above ( )

2. Which one of the following is not a category of software metrics?

(a) Product metrics ( )

(b) Process ( )

(c) Project metrics ( )

(d) People metrics ( )

3. The most desirable form of coupling is

(a) control coupling ( )

(b) data coupling ( )

(c) external coupling ( )

(d) stamp coupling ( )

4. SRS document is for

(a) 'what' of a system ( )

(b) how to design the system ( )

(c) costing and scheduling of a system ( )

(d) system's requirement ( )

5. Software consists of

(a) set of instructions + operating system ( )

(b) programs + documentation + operating procedures ( )

(c) programs + hardware manuals ( )

(d) set of programs ( )

6. Which one of the following is not a category of maintenance?

(a) Corrective maintenance ( )

(b) Adaptive maintenance ( )

(c) Effective maintenance ( )

(d) Perfective maintenance ( )

7. In COCOMO model, if project size is typically 2–50 KLOC, then which mode is to be selected?

(a) Embedded ( )

(b) Semi-detached ( )

(c) Organic ( )

(d) None of the above ( )

8. Context diagram explains

(a) the overview of the system ( )

(b) the internal view of the system ( )

(c) the entities of the system ( )

(d) None of the above ( )

9. The worst type of cohesion is

(a) temporal cohesion ( )

(b) logical cohesion ( )

(c) functional cohesion ( )

(d) coincidental cohesion ( )

10. If limited user participation is available, then which model is to be chosen?

(a) Waterfall model ( )

(b) Spiral model ( )

(c) Iterative enhancement model ( )

(d) Any of the above ( )

**II.** State whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark : 1×5

1. A good design will have low coupling and high cohesion.

*(T / F)*

2. The Rapid Application Development (RAD) model is a type of evolutionary process model.

*(T / F)*

3. A failure is the defect in a program that, when executed under particular conditions, causes a fault.

*(T / F)*

4. The two-schema architecture can be used to explain data independence.

*(T / F)*

5. The degree of a relationship is the number of entity types that participate in that relationship.

*(T / F)*

## SECTION—II

( *Marks* : 10 )

I. Answer the following questions : 2×5=10

1. *(a)* Discuss two reasons why it is difficult to improve the software process.

**OR**

*(b)* Briefly explain the four sectors of major activities into which each phase of the spiral model is split.

2. *(a)* Differentiate between functional and non-functional requirements.

**OR**

*(b)* Differentiate between enduring requirements and volatile requirements.

3. *(a)* Bring out the relationship between cohesion and coupling.

**OR**

*(b)* Distinguish between top-down and bottom-up design approaches.

4. *(a)* Define data structure metrics. How can we calculate the amount of data in a program?

**OR**

*(b)* What do you understand by models in software planning? Bring out the difference between static and dynamic models.

5. *(a)* Distinguish between alpha and beta testing.

**OR**

*(b)* Differentiate between corrective maintenance and adaptive maintenance.

## ( PART : B—DESCRIPTIVE )

( *Marks* : 50 )

**IV.** Answer the following questions : 10×5=

1. *(a)* How are increment process models different from evolutionary process models? Discuss the prototyping model of software development. 2+4

   *(b)* Make a list of the different myths associated with software development. Bring out how these myths affect the software process. 2+2

   **OR**

   *(c)* Write a note on the different areas of software applications.

   *(d)* List the relative advantages and disadvantages of using waterfall model instead of ad hoc build and fix model.

2. *(a)* Explain the importance of requirements and requirement engineering in the software development process. What are the problems in the formulation of requirements?

   *(b)* Discuss the Use Case approach of requirement elicitation. 3+3

   **OR**

   *(c)* Explain the different steps in the requirements review process with the help of a suitable diagram.

   *(d)* Differentiate between level-0 DFD and level-1 DFD with the help of suitable examples.

3. *(a)* Discuss the different types of cohesion.

   *(b)* What is modularity? List the important properties of a modular system.

   **OR** 1+3=

   *(c)* Explain the concepts of abstraction, polymorphism and inheritance with regards to object-oriented design. 2+2+2=

   *(d)* Why is design important? Write a short note on the objectives of design. 2+2=

4. *(a)* Discuss various modes of COCOMO basic model. 4

*(b)* Explain the two size estimation techniques. 6

**OR**

*(c)* Write a note on the top five risk factors that threaten software projects in different applications. 5

*(d)* Define software metrics. Discuss information flow metrics. 2+3=5

5. *(a)* Explain structural testing. Highlight its differences from that of functional testing. 3+2=5

*(b)* Discuss the various phases of the maintenance process. 5

**OR**

*(c)* What is software reliability? How is it different from hardware reliability? 1+3=4

*(b)* Explain the three traditional levels of testing. 6

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## SECTION—II

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## ( PART : B—DESCRIPTIVE )

( *Marks* : 50 )

**IV.** Answer the following questions : 10×5=50

1. *(a)* How are increment process models different from evolutionary process models? Discuss the prototyping model of software development. 2+4=6

   *(b)* Make a list of the different myths associated with software development. Bring out how these myths affect the software process. 2+2=4

   **OR**

   *(c)* Write a note on the different areas of software applications. 5

   *(d)* List the relative advantages and disadvantages of using waterfall model instead of ad hoc build and fix model. 5

2. *(a)* Explain the importance of requirements and requirement engineering in the software development process. What are the problems in the formulation of requirements? 3+3=6

   *(b)* Discuss the Use Case approach of requirement elicitation. 4

   **OR**

   *(c)* Explain the different steps in the requirements review process with the help of a suitable diagram. 5

   *(d)* Differentiate between level-0 DFD and level-1 DFD with the help of suitable examples. 5

3. *(a)* Discuss the different types of cohesion. 5

   *(b)* What is modularity? List the important properties of a modular system. 6

   **OR**

   *(c)* Explain the concepts of abstraction, polymorphism and inheritance with regards to object-oriented design. 1+3=4

   *(d)* Why is design important? Write a short note on the objectives of design. 2+2+2=6

4. (a) Discuss various modes of COCOMO basic model. 4

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(d) Define software metrics. Discuss information flow metrics. 2+3=5

5. (a) Explain structural testing. Highlight its differences from that of functional testing. 3+2=5

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