

2024

COMPUTER SCIENCE — HONOURS

Paper : CC-13

(Software Engineering)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer *question no. 1* and *any four* questions from the rest.

1. Answer *any five* questions : 2×5
- (a) What is perfective maintenance?
 - (b) Why do we need a stub module?
 - (c) Describe the role of a 'System Analyst'.
 - (d) What is meant by structured programming?
 - (e) Describe the various steps of requirements engineering.
 - (f) Explain the term 'portability' with respect to Software Engineering.
 - (g) Name any four SQA activities.
 - (h) Explain the characteristics of a good SRS document.
2. (a) How do basic, intermediate and complete COCOMO differ from each other? Explain.
- (b) Explain the Delphi cost estimation technique. Write its advantages and disadvantages. 5+5
3. (a) What do you mean by Software Products?
- (b) Explain the phases of Spiral Model with advantages and disadvantages.
- (c) List three common types of risks that a typical software project might suffer. 2+5+3
4. (a) Discuss the limitations of testing. Why do we say that complete testing is impossible?
- (b) What are the differences between code reviews and code walkthrough? (3+2)+5

Please Turn Over

5. (a) Which one is conceptually stranger : Branch coverage criterion or condition coverage criterion? Explain with an example.
- (b) Draw the control flow graph for the following program. Also calculate the cyclomatic complexity.

```
int fact (int n) {
    int fact = 1;
    if (x==1)
        return (1);
    else
        for (i=1; i<=n; i++)
            fact=fact*i;
    printf ("factorial=%d", fact);
    return (fact);}
```

5+5

6. (a) What is a context diagram?
- (b) What is the main purpose of DFD?
- (c) Obtain logical DFD for the following problem.

A magazine is published monthly and is sent by post to its subscriber. 2 months before the expiry of subscription, a reminder is sent to the subscribers. If subscription is not received within a month, another reminder is sent. If renewal subscription is not received within the due date, the subscriber's name is removed from the mailing list and subscriber is informed.

2+2+6

7. (a) Draw a structure chart for 'employee payroll management'.
- (b) How does 'logical cohesion' differ from 'temporal cohesion'?
- (c) What is a test case suite? Give an example.

4+3+(2+1)

8. (a) Briefly discuss and compare software validation and verification.
- (b) Consider a system taking 'age' as an input, and the valid range is 21 to 65. Design test cases, keeping in mind 'boundary value analysis', and give proper reasoning.
- (c) When comparing Alpha testing vis-à-vis Beta testing, which is more impactful and why?

4+3+3