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 it's 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*1;
  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

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