

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 2381

F-4

Your Roll No.....

Unique Paper Code : 2341402

Name of the Course : B.Tech Computer Science

Name of the Paper : Software Engineering

Semester : IV

Duration : 3 Hours

Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The paper has **two** sections.
3. All questions in '**Section A**' are compulsory.
4. Attempt **any four** questions from '**Section B**'.
5. Parts of a question must be answered together.

**SECTION A**

1. (i) Comment on the statement "Software does not wear out. Justify your answer by explaining bathtub failure curve for software. (3)
- (ii) Explain any three umbrella activities used in Software development Process. (3)
- (iii) What is the significance of creating a risk table ? (2)
- (iv) What are disadvantages of waterfall model ? (3)
- (v) Explain any three agility principles. (3)
- (vi) Differentiate between functional abstraction and data abstraction. (3)
- (vii) What are the factors effecting coupling ? (3)

*P.T.O.*

- (viii) Differentiate between private and public metrics. (3)
- (ix) Explain any three components of an SRS ? (3)
- (x) Explain the drawbacks of both LOC and FP (Function Point) used as an estimation variables. (3)
- (xi) Explain regression testing. (3)
- (xii) What is risk exposure ? How is Risk Exposure determined ? (3)

### SECTION B

- 2. (a) Explain spiral model with suitable diagram suggested by Boehm. What is the significance of anchor point milestones ? (5)
  - (b) What are various generic process framework activities that are applicable to vast majority of software projects ? (5)
3. Create context level and level 1 DFD (Data Flow Diagram) and its associated data dictionary of a system that generates paycheck considering the following requirements :
- The basic input is the weekly timesheet
  - The source for the input is a worker
  - The basic output is the paycheck
  - The sink for the output is also a worker
  - Procedure:
    - o In this system, first the employee's record is retrieved, using the employee ID, which is contained in the timesheet.
    - o From the employee record, the rate of payment and overtime are obtained.
    - o These rates, and the regular and overtime hours are used to compute the pay.
    - o After the total pay is determined, taxes are deducted.

- o To compute the tax deduction, information from the tax rate file is used.
- o The amount of tax deducted is recorded in the employee and company records.
- o Finally, the paycheck is issued for the net pay.
- o The amount paid is also recorded in the company records.

(3+4+3)

4. (a) Create a flow graph to find the cyclomatic complexity of the following code. Also show all the independent paths and regions :

```
1. Begin
2.   i = 0; n=4;
3.   while ( i < n-1) do
4.     j=i + 1;
5.     while (j <n) do
6.       if A[i]<A[j] then
7.         swap(A[i], A[j]);
8.       end do;
9.       i=i+1;
10.    end do;
11. End
```

(6)

- (b) Explain how maintainability and integrity of the software are used as a measure of software quality. (4)

5. (a) Compute Function Point value for a project with the following information domain characteristics :

*P.T.O.*

Measurement Parameters	Count	Weighing factors		
		Low	Average	High
Number of user inputs	30	3	4	6
Number of user outputs	51	4	5	7
Number of user inquiries	24	3	4	6
Number of files	6	7	10	15
Number of external interfaces	3	5	7	10

Assume the measurement parameters equally divided among low, average and high complexity. Further, assume that the complexity adjustment value is 1.05. (6)

- (b) Explain the cost impact of the software defects using Defect Amplification model. (4)
6. Differentiate between the following :
- (a) Alpha testing and Beta Testing
  - (b) Cohesion and Coupling
  - (c) Reactive and Proactive risk strategies
  - (d) Analysis and Design Model (10)
7. (a) Define Unit Testing. Explain any three considerations of unit testing. (4)
- (b) Use the COCOMO II model to estimate effort required to build software that produces 12 screens and 10 reports, and will require approximately 80 software components. Assume average complexity (screen-2, reports-5) and average developer/environment maturity as 13. Use the application composition model with object points. (6)