[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)

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(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.

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    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)

(2000)