[This question paper contains 6 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 2209 **IC**

Unique Paper Code : 32341402

Name of the Paper : Software Engineering

Name of the Course : **B.Sc. (H) Computer Science**

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. **All** questions in **'Section A'** are compulsory.
3. Attempt any **five** questions from **'Section B'**.
4. Parts of a question must be answered together.

SECTION A

1. (i) Which of the following Software Process Model is more effective? Give one reason. Incremental Model or Linear sequential Model. (2)

(ii) Write the difference between Direct and Indirect metric. Give one example for both the metrics. (3)

(iii) What do you mean by Reactive and Proactive risk strategies? (3)

(iv) Explain the following characteristics of SRS :

(a) Verifiable

(b) Traceable (3)

(v) State the significance of a Gantt Chart for scheduling and monitoring a software project. (2)

(vi) Explain the following two measures of Software Quality :

(a) Usability

(b) Correctness (3)

(vii) Explain with the help of a diagram failure curves for software. (3)

(viii) At the conclusion of a project, it has been determined that 30 errors were found during the modeling activity and 12 errors were found during the construction activity. What is the Defect Removal Efficiency for this activity? (2)

(ix) Write any three ways to achieve reliable cost and effort estimates. (3)

(x) A system has 2 external inputs, 5 external outputs, 3 external queries, manages 5 internal logical files, and interfaces with 3 external legacy systems. All of these data are of simple complexity 3, 4, 3, 7, and 5 respectively. The overall system is relatively simple. Compute Function Point for the system. (3)

(xi) State the advantages & disadvantages (three each) of Spiral model. (3)

(xii) List different types of System Testing. (3)

(xiii) What are the two approaches used for designing hierarchy of components when we are designing a software? (2)

SECTION B

2. (a) What is cohesion? Discuss briefly any three levels of Cohesion? (6)

(b) Explain briefly the first four layers of CMMI. (4)

3. (a) What are software reviews? Explain Defect Amplification Model when no reviews are conducted. (5)

(b) Differentiate between white box and black box testing methods. (5)

4. (a) A supermarket develops the following software to encourage regular customers. For this,

1. The customer needs to supply his/her residence address and telephone number.

2. Each customer who registers for this scheme is assigned a unique customer number (CN) by the computer.

3. A customer can present his CN to the check out staff when he makes any purchase. In this case, the value of his purchase is credited against his CN.

4. At the end of each year, the supermarket intends to award surprise gifts to 10 customers who make the highest total purchase over the year.

5. Also, it intends to award a 22 caret gold coin to every customer whose purchase exceeded Rs. 10,000. The entries against the CN are reset on the day of every year after the prize winners' lists are generated.

Draw a Context level and level 1 Data Flow Diagram for the system given above. Also develop Data Dictionary for the same. (8)

(b) What is Transform Mapping? (2)

5. **(a) Use the flow graph to find Cyclomatic Complexity of the following code. Also Write the independent paths and show the regions :**

```
Begin
Int x,y,power;
Float z;
Input(x,y);
If(y<0)
  Power = -y;
Else
  Power = y;
Z=1;
While(power !=0) {
Z=z*x;
Power = power-1;
}
If(y<0)
Z=1/z;
Output(z);
End
```

(6)

P.T.O.

(b) What do you understand by Risk Exposure? In a component based system 60 reusable software components were planned. From these components only 70 percent can be used, rest have to be developed from the scratch. Cost for each LOC is $14.00. The probability of this risk occurrence is 80%. Compute Risk Exposure. (4)

6. (a) What is boundary value testing? State the guidelines to create boundary value testing for test cases with two examples. (5)

(b) Use the COCOMO II model to estimate the effort required to build software that produces 10 screens and 8 reports, and will require approximately 80 software components. Assume average complexity Screen-2, Reports-5, 3CGL components-10 and average/developer/environment maturity as 13. Use the application composition model with object points. (5)

7. Write short notes on :– **(Any two)**

(i) Unit Testing

(ii) Prototyping Model

(iii) Software Engineering a layered technology (10)

(1400)