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7. Briefly explain any **four** of following : (2.5×4)

- (a) Quality Assurance & Quality Control
- (b) Verification & Validation
- (c) Risk mitigation, monitoring and management (RMMM)
- (d) Defect Removal Efficiency
- (e) Capability Maturity Model Integration (CMMI)

(500)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 2998 **H**

Unique Paper Code : 32341402

Name of the Paper : Software Engineering

Name of the Course : **B.Sc. (Hons.) 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. This 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.

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**SECTION A (35 Marks)**

1. (i) "Software Engineering is layered technology".  
Justify the statement. (3)
- (ii) What do you understand by known, unknown and undreamt requirements? (3)
- (iii) A Company is developing a mobile application having 3 modules named A, B and C. Due to the urgency of launching the application, the customer wants the C module to be delivered and deployed first and then other modules may be required in successive versions. Which process model would be appropriate for this application and why? (3)
- (iv) What types of risk are you likely to encounter as software is built? (3)
- (v) Discuss any three Process flows for software development. (3)

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Void sum()

Input – Array of n integers

Output – Count Even and Count Odd.

Begin:

i=1, count even = 0, count\_odd = 0

while (i <= n){

if (a[i] % 2 == 0)

count\_even = count\_even + 1

else

count\_odd = count\_odd + 1

endif

i = i + 1

end while

End

- (b) What do you understand by Integration testing?  
Briefly describe various types of Integration testing. (4)

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(b) Draw Use Case Diagram also.

5. What do you understand by Black Box testing? Briefly explain any two approaches of black box testing. (2+4+4)

Consider a program for computing the function  $f(a, b)$ , where the input boundaries of  $a$  and  $b$  are given below :-

$5 \leq a \leq 15$

$15 \leq b \leq 30$

Design the boundary value testcases for the above program.

6. (a) Create a flow graph to find the cyclomatic complexity of the following code using three different methods, also show the number of independent paths and regions. (3+3)

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- (vi) Differentiate between alpha and beta testing. (3)
- (vii) Explain the difference between technical and conceptual design. (3)
- (viii) What is coupling? Explain briefly **any two** types of coupling. (3)
- (ix) What is an Agile process? List **any two** agility principles. (3)
- (x) Describe any four of the ISO 9126 Quality Factors. (4)
- (xi) Define Software Integrity. What will be the integrity of a software if the probability of threat is 0.30 and probability of security is 0.95? (2+2)

### SECTION B

2. (a) Explain the crucial steps of requirement engineering using a diagram. (6)

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(b) Briefly explain the generic process framework activities. (4)

3. (a) What do you understand by a structure chart?

Prepare a structure chart for handling email server.

The email server contains following modules :

- Enter login details.
- Verify login details from a database.
- View mailbox module with conditional call of View messages and Compose messages submodules.
- Compose messages module repetitively calls to Send messages submodule. (6)

(b) How project scheduling facilitates the software development team? Draw Timeline Chart to illustrate project scheduling with an example.

(4)

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4. A restaurant provides food services to the customers and generates the receipt for payment. The functional requirements of the restaurant are listed below :

(2+4+4)

- The basic input is the ordered items and output is payment receipt.
- The source input for the system is the customer and the sink is also a customer.
- In this system, first the customer's order is placed using order id, stored into an Order database.
- From the Order database, the ordered items are obtained and the payment receipt is generated for the customer.
- The amount paid by the customer is also recorded in the Payment database.

(a) Create a context level diagram and a level-1 Data Flow Diagram (DFD) for the system described above.