SASTRA

DEEMED TO BE UNIVERSITY

School of Computing
First CIA Examination – Feb '24
Course Code: CSE215
Course Name: Software Engineering
Duration: 90 minutes Max Marks: 50

PART A

Answer all the questions **5 x 2 marks = 10 marks**

1. Build the layered technology components of software.
2. Derive any four umbrella activities of software engineering.
3. Enlist all prescriptive process models, specialized process models
4. How does the Capability Maturity Model Integration level(CMMI) determines the company reputation?
5. Developer A wants to develop similar existing Online shopping app as flipkart,
   Developers B Team wants to develop a new satellite to Jupiter.
   Justify your answer for the given software system with suitable decomposition strategies, process models.

PART B

Answer to all Questions **3 x 10 marks = 30 marks**

6. Identify the process flow, process model, life cycles steps, effort nature of given software.(5 marks)
   Draw its process model with its advantages and disadvantages.

Software Name	Process flow Name	Process model Name	Life cycle phases	Organic/ Semi attached/ embedded
Jinux OS				
National Rose				
Smart watch ver3.0				
Open OfficeXP Package				

7. Calculate FP count, **Value Adjustment Factor** and **Total FP count** of given ABC company's MIS
using Cost constructive model- COCOMO.

Marketing MIS:

Function	Raw FP
Monthly sales	4 reports
Sales summary1	5 documents
Sales summary2	5 documents
Sales summary3	5 documents
Sales summary4	5 documents
Sales summary5	5 documents
Sales Enquiry	4
Sales files	10
Product files	7
Location file	7

General Specification Characteristics are: (GSC)

Performance = 3 , reusability = 4,
Online updates =3, Installation easiness = 4
Online data entry = 3, Operational easiness = 4
End-user efficiency = 4, change facilitation = 5

8. Find Software size of given CAD software: A range of LOC estimates is developed for each function. For example, the range of LOC estimate for the 3D geometric analysis function is optimistic, 4600 LOC; most likely, 6900 LOC and pessimistic, 8600 LOC, And calculate Effort of the same using $E = 3.2 * (KLOC)^{1.05}$ Boehm simple KLOC method.

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PART A

Answer to all Questions **10 x 2 marks = 20 marks**

1. Design a use case diagram of "withdrawing Money from ATM" Scenario and get a concurrent message from the bank with 3 types of actors.
2. Develop sequence diagram for "Rhyme App" to school children that narrates chosen English rhymes then translates its meaning automatically towards NLP using google translator and finally stored in a google drive.
3. Identify Domain classes, Analysis classes, Potential classes, Design classes of "online Food ordering system"
4. Build the design pattern template.
5. Find the online, offline collaborators of the following to the Online Hospital Management System: HomePage, DBAdmin, Patients, Doctors, Receptionist, TokenNo, Visitors, Camera, medicines, prescription_report, Scan_report, XRay_machine and draw collaboration diagram
6. Find architectural style of the following:
   a. Mobile phone recharge system by multiple **clients**, ISP
   b. Online exam system through **centralized Question repository** for JEE exam.
   c. Binary **pipeline** search of Not-available element
   d. Component, Package, Modules, program, instruction and data design
7. Why does a good software design must exhibits firmness, commodity, delight? Justify.
8. What are the design issues of UI design and design models of it?

9. Find correct terms and Match the following architectural genre:

Artificial Intelligence - Netflix

Commercial – Alexa

Communication - cricInfo

Sports - telegram

10. What is the need for refactoring?

PART-B

Answer any three Questions: **3 x 10 marks = 30 marks**

11. a. Explain all Design principles, b. Elaborate all types of coupling and cohesion of component level design. (5+5 marks)
12. Explain all OO concepts and Fundamental design concepts with example (5+5 marks)
13. Explain all UI principles.
14. Explain the components (5marks) of Conversion process of "analysis to design model" with suitable pyramid picture. (5marks)

SASTRA

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THINK MERIT | THINK TRANSPARENCY | THINK SASTRA

School of Computing

Third CIA Examination – Apr '24

Course Code: CSE215

Course Name: Software Engineering

Duration: 90 minutes Max Marks: 50

PART A

Answer all the questions **10 x 2 marks = 20 marks**

1. Expand the following quality factors of the software: FURPS.
2. Define all concurrent modeling phases.
3. Derive the steps of requirement engineering process.
4. How many levels are maintained in the CMMI of the software?
5. Identify any two metrics of the software estimation from 4Ps.
6. State Beizer's four Behavior modeling testing methods
7. Design any four domain classes of "University Management system"
8. What are the two phases of documentation testing?
9. Enlist all approaches of Integration testing.
10. Give the guidelines of defining equivalence partitioning classes.

PART B

Answer any two Questions **2 x 10 marks = 20 marks**

11. Differentiate V-Model and Water fall model by its process flow diagram, advantages and disadvantages.
12. Assume there is an another version of Open Office package which consist of additional package as "insert a new object with AR modeling on camera captured images". Identify major, inter tasks and attributes of given OO software for an OOTesting.
13. Construct L9 Orthogonal array for the given software problem:

A microprocessor's functionality has to be tested to the given factor.
Temperature: 100C, 150C and 200C.
Pressure : 2 psi,5psi and 8psi
Doping Amount :4%,6% and 8%
Deposition Rate : 0.1mg/s , 0.2 mg/s and 0.3mg/s at these three levels

PART C

Answer to all Questions **1 x 10 marks = 10 marks**

14.a Draw flow graph, graph matrix of the following instruction set and find cyclomatic complexity. (2 marks)

```
Start → (1)
Declare a,b,c → (2)
Get(a,b,c);
d=sqrt(b*b-4a*c); → 3
r1=d/2*a; → 4
r2=-d/2*a; → 5
if (d==0) → 6
 print("roots are equal"); → 7
else if (d>0) → 8
 print(" roots are real"); → 9
else if (d<0) → 10
 print("roots are complex"); → 11
else print ("invalid inputs"); → 13
endif
print(r1,r2); → 14
end
→ (15)
```

14.b. Perform selective path testing, control structure and loop testing of matrix operations such as 1. Matrix addition 2. Matrix subtraction 3. Matrix multiplication with necessary constraints and verification points. (3 marks)

14.c. How to conduct Model based testing (MBT) for the "online food ordering and delivery system" with atleast 3 UML models?
Write the steps and guidelines of MBT.(3 marks)

14.d. Differentiate real time system testing with stand alone conventional module based software testing. (2 marks)

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