Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	**Semester**	5
Subject Code	PEIT-10	**Subject Title**	Software Modelling and Analysis
Mid Semester Test (MST) No.	I	**Course Coordinator(s)**	Sandeep Kumar Singla
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	30.09.2024	**Roll Number**	2203851

Note: Attempt all questions.

Q. No.	Question	COs, RBT level	Marks
Q1	If software does not wear out, why do software systems still experience failures and need maintenance? Explain with valid reasons.	CO3, L2	2
Q2	How can poor abstraction, decomposition, or generalization lead to tightly coupled systems and hinder maintainability?	CO3, L4	2
Q3	Describe the meaning of preconditions and post conditions with the help of real world examples.	CO2, L3	4
Q4	Choose the functional and non-functional requirements for online shopping system.	CO2, L3	4
Q5	Do you agree with the following statement—The focus of exploratory programming is error correction while the software engineering principles emphasize error prevention"? Give reasons behind your answer.	CO1, L4	4
Q6	Explain various phases of software development life cycle (SDLC). What do you understand by the term phase containment of errors? Why is phase containment of errors is considered to be important? How can phase containment of errors be achieved in a software development project?	CO1, L5	8

Course Outcomes (CO) *Students will be able to*

1	Identify and explain contemporary software life cycle processes, activities, and work products
2	Elicit, analyze and specify software requirements through a productive working relationship with project stakeholders.
3	Demonstrate formal correctness of simple procedure.
4	Implement sequential software systems based on formal models.
5	Verify attributes of formal models
6	Describe the costs and benefits of formal methods.

RBT Classification	**Lower Order Thinking Levels (LOTS)**			**Higher Order Thinking Levels (HOTS)**		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

220385

Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	**Semester**	5
Subject Code	PEIT-104	**Subject Title**	Software Modelling and Analysis
Mid Semester Test (MST) No.	2	**Course Coordinator(s)**	Sandeep Kumar Singla
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	22.11.2024	**Roll Number**	220385

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Why is it necessary to construct more than one type of model of a problem?	CO5, L2	2
Q2	What are the most commonly used architectural patterns in software design, and how do they address different types of requirements (e.g., scalability, flexibility, performance)?	CO3, L4	2
Q3	Can you explain in your own words the different stages of risk-based analysis? How does the use of Fault Trees contribute in analyzing dependability?	CO4, L2	4
Q4	Interpret the following statement with valid reasons "Formal methods provide us with tools to precisely describe a system and show that a system is correctly implemented".	CO6, L3	4
Q5	Analyze "Generalization" relationship among the classes through class diagrams of appropriate examples. Note: Only class diagram and a line of explanation is required.	CO2, L4	4
Q6	Based on your experience with a bank ATM, draw an activity diagram that models the data processing involved when a customer withdraws cash from the machine. Draw a sequence diagram for the same system. Explain why you might want to develop both activity and sequence diagrams when modeling the behavior of a system.	CO4, L5	8

Course Outcomes (CO) *Students will be able to*

1	Identify and explain contemporary software life cycle processes, activities, and work products
2	Elicit, analyze and specify software requirements through a productive working relationship with project stakeholders.
3	Demonstrate formal correctness of simple procedure.
4	Implement sequential software systems based on formal models.
5	Verify attributes of formal models
6	Describe the costs and benefits of formal methods.

...paper contains 09 questions and 02 printed pages within first ten minutes.

[Total No. of Questions: 09]
Uni. Roll No. .2.2.0.3.8.5.1.....

[Total No. of Pages: 02]

Program: B.Tech. (Batch 2018 onward)
Semester: 5th
Name of Subject: Software Modelling and Analysis
Subject Code: PEIT-104
Paper ID: 16447

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) What are software paradigms?
b) Outline some limitations of spiral model.
c) Point out the two kinds of stimuli that fall under behavioural models.
d) What is the importance of enterprise modelling?
e) What is correctness analysis of an algorithm?
f) Outline the steps to create a domain model.

Part – B **[Marks: 04 each]**

Q2. Elaborate the cost effective solutions used for software modelling.

Q3. What are the advantages and disadvantages of iterative software development model?

Q4. Distinguish between decomposition and generalization with example.

Q5. Draw and explain the class diagram of an ATM machine.

Q6. Describe the purpose of an interaction diagram.

Q7. Explain the various steps of failure modes and effects analysis process.

Part – C

[Marks: 12 each]

Q8. Explain the following: (i) waterfall model (ii) Spiral model (iii) RAD model (iv) Prototyping model.

OR

Discuss the requirements analysis and specifications related to software engg. Also discuss the significance of engineering Economics for software.

Q9. Explain the different styles of objects known throughout domain analysis and the area of their relationship unit. Also create a model for your embedded system that have time-saving and cost-effective approach that lead to the development of dynamic control systems, based on a single model maintained in a tightly integrated software suite.

OR

Discuss the concept of theorem proving for cyber physical system verification. Also explain the difference between simulation and model?

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