Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2013

Subject code: 1720105 Date: 31-12-2013

Subject Name: Object Oriented Methodology & Design

Time: 10.30 am – 01.00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What is modeling and its significance? Compare and contrast three models (Object, Dynamic and Functional). Draw object model of windowing system. **07**

(b) Using the quadratic formula as a starting point, prepare a Data flow diagram for computing the roots of the quadratic equation $ax^2 + bx + c = 0$. Real numbers, *a, b* and *c* are inputs. Outputs are values of $x = R1$ and $x = R2$, which satisfy the equation. Remember *R1, R2* may be real or complex, depending on the values of *a, b* and *c*. The quadratic formula for *R1* and *R2* is $(-b \pm SQRT (b^2 – 4ac)) / (2a)$. **07**

Q.2 **(a)** Define following terms **07**
(i) Synergy (ii) Genericity (iii) Refactoring (iv) Abstract Superclass (v) Scenario (vi) Object Serialization (vii) Cohesion (viii) Reflection (ix) Downcasting.

(b) What is RTTI? Explain all the approaches to achieve it and write suitable code. **07**

OR

(b) Identify singleton classes in a university that maintains several separate collections including the following for storing the list of faculty members, the list of students, the list of staff members, and one that maintains a list of these collections themselves. **07**

Q.3 **(a)** What is class diagram? Draw an use case & corrospinding sequence diagram for withdrawing money from an ATM. **07**

(b) Describe types of UML diagrams with appropriate figure. Explain any two with suitable example. **07**

OR

Q.3 **(a)** Consider the policies maintained by an automobile insurance company. A policy has a primary policy holder, a set of autos insured, and a list of people who are covered by the insurance. From your knowledge of insurance , come up with system use cases for **07**

(i) Creating a new policy
(ii) Adding a new person to a policy
(iii) Adding a new automobile to a policy
(iv) Recording a claim

	(b)	Explain why mistakes made in requirement analysis stage are the costliest to correct. And among the following requirements which are the functional and which are non functional? (i) Paychecks should be printed every two weeks (ii) Database recovery should not take more than 1 hour (iii) The system should be implemented using the C++ language. (iv) It should be possible to selectively print employee checks. (v) Employee list should be displayed in list of size 10.	**07**
Q.4	**(a)**	What is exception? List out at least five and explain with suitable example.	**07**
	(b)	A manager at a small zoo instructs the zoo keeper to 'feed the animals'. Explain how a proper completion of this task by the zoo-keeper implies that the zoo operations are implicitly employing the concepts of inheritance, polymorphism and dynamic binding.	**07**
		OR	
Q.4	**(a)**	What is refactoring? Explain in detail with example.	**07**
Q.4	**(b)**	What is interface? Explain colneable interface and give an example of runnable interface.	**07**
Q.5	**(a)**	What is inheritance hierarchy? Explain multiple inheritance with suitable example.	**07**
	(b)	Prepare a state transition diagram microwave oven using observer pattern.	**07**
		OR	
Q.5	**(a)**	Prepare State transition diagram for TCP.	**07**
	(b)	Explain concept of aggregation and generalization, draw an object model of windowing system.	**07**

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