Total No. of Questions : 10]

SEAT No. :

P3175

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B.E. (Information Technology)

SOFTWARE MODELING AND DESIGN

(2012 Pattern)

Time : 2½ Hours] *[Max. Marks :70*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.***
2) ***Figures to the right indicate full marks.***
3) ***Draw appropriate diagrams using UML 2.0 notations.***
4) ***Use of non programmable electronic calculator is allowed.***

Q1) a) Indentify classes, and relate the classes using appropriate relationships by drawing class diagrams. **[6]**

i) Company is led by CEO (Chief executive officer).

ii) A college belonging to university is composed of the parts as one admin office, several departments, and research centers.

b) With the context of use case diagram, show the relationships include & extend using an example. **[4]**

OR

Q2) a) Explain with an example : **[6]**

i) Aggregation Verses Association

ii) Aggregation Verses Composition

b) Show the following description with appropriate OCL notation. **[4]**

i) No employee's salary can exceed the salary of the employee's boss.

ii) No window will have an aspect ratio less than 0.8 or greater than 1.5.

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Q3) a) Draw a state diagram for ATM system with the following scenario Initially the ATM is in IDLE state and displays bank's advertisement on the screen. When the customer inserts the card into the ATM, the ATM transits from the IDLE state to ACTIVE state. ATM being in active state, when the Card Inserted event arrives, it is goes in the waiting for PIN state, during which time the ATM is waiting for the customer to input the PIN. When the customer completes the entering of PIN, the ATM transits to the Validating PIN state. When the customer entered PIN matches the stored PIN for the card. Assuming the PIN validation successful, the ATM transits to waiting for Customer choice state. **[6]**

b) Explain Fork and Join with example in context with Activity diagram. **[4]**

OR

Q4) a) Consider an online web based "Computer Rental System "Draw a **sequence diagram** for **Rent a computer** use case with the following assumptions.

The customer needs to first select the type of computer he wants to rent. The database of computers is maintained based on its types like: Desktop, Laptop, Notepads, Pocket PC etc. Based on the type of computer the rents are displayed, if the chosen type of computer is available, the booking is done, confirmed, the booking details are stored and the customer is issued an electronic confirmation of the booking.**[6]**

b) Explain transition & guard condition in state diagram with example. **[4]**

Q5) a) Describe batch transformation and continuous transformation. **[8]**

b) Write the purpose of deployment diagram. Draw & explain the following element of deployment diagram **[8]**

i) Node

ii) Artifact

iii) Node instance

OR

Q6) a) Explain layered architecture & partitions. **[8]**

b) Draw component diagram for online shopping system. **[8]**

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Q7) a) What is design pattern? Explain 4 essential elements of patterns. **[8]**

b) Explain the Design pattern documentation. **[8]**

OR

Q8) a) Write a short note on **[8]**

i) Observer design pattern

ii) State design pattern

b) Write the classification, motivation, class diagram and uses of adapter design pattern. **[8]**

Q9) a) Differentiates between Black box testing and white box testing. **[8]**

b) Draw and explain V-model. **[10]**

OR

Q10)a) Explain unit testing in details. **[8]**

b) Define software validation and software verification. **[10]**

Explain verification and validation concept by considering the following statements:

i) Are we building the product right?

ii) Are we building the right product?

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