B.E./Insem. - 61
B.E. (IT)
SOFTWARE MODELING AND DESIGN
(2012 Pattern) (Semester - I)

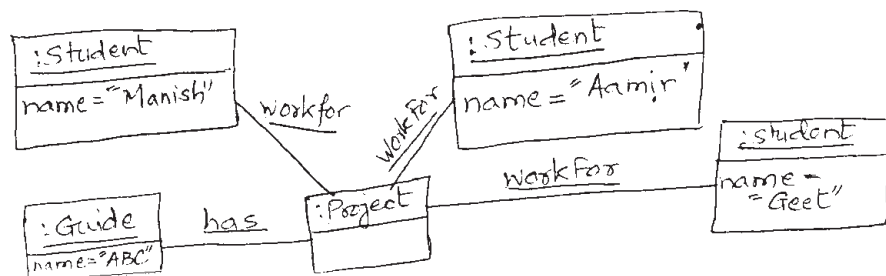*Time :1Hour]*   *[Max. Marks :30*

Instructions to the candidates:-
  1) Solve Q1 or Q2, Q3 or Q4, Q5 or Q6
  2) Use UML2 notations for drawing UML diagrams.

Q1) Solve the following :

  a) A file system has many files. A file can be ASCII file, binary file or directory file. Files are stored in a disk. Disk contains many tracks. A track is made up of many sectors. Convert this into a class diagram with appropriate relationships, multiplicity.   **[2]**

  b) What is qualified association? Draw its notation in using an example.**[2]**

  c) Construct a class diagram using the following object diagram.   **[3]**

  d) What is n - ary association? Show with an example.   **[3]**

                                     OR

Q2) Convert the following into a class diagram with appropriate classes, relationships, multiplicity

  a) A computer program has many statements. An expression is a statement. A function is statement. An expression contains a variable, a constant, an operator. A relational operator is an operator. An arithmetic operator is an operator. A function has an argument list, a return type.   **[3]**

  b) Car dealer sales cars. A car is owned by an owner. The owner has an address. The owner can be a person, a company or a bank. A car loan may be involved in the purchase of a car. Bank provides the loan.   **[3]**

                                                              P.T.O.

c) A drawing object is a text, a geometric object or a group. Group can contain at least two geometric objects. Point, polygon are geometrical objects. A polygon is composed of an ordered set of points. **[4]**

Q3) a) A simple digital watch has a display and two buttons, button 'A' and 'B' to set it. The watch has two modes of display, 'display time' mode and 'set time' mode. In the display time mode, the watch displays the hours and minutes separated by a flashing colon. The set time mode has two sub modes, set hours, and set minutes. The 'A' button selects modes. Each time it is pressed, the mode advances in a sequence : display time, set hours and set minutes. Within the sub modes , the B button advances the hours or minutes once each time it is pressed. Buttons must be released before they can generate another event. Prepare a state diagram of the watch. **[5]**

b) Consider a software that manages electronic music files. Some use cases are *'view songs by title', view songs by artist, 'view songs by album', play a song', 'play an album', 'randomize order'.* Prepare a use case diagram, include appropriate relationships for the use cases. You can add an appropriate parent use case for use case generalization. **[5]**

OR

Q4) a) When the power is OFF a copying machine is OFF. When the power is ON, it starts warming. During warming it flashes the 'ready' light. When it is ready, it turns the ready light 'on' and displays the parameters on the display panel as number of copies = '1' and size = 'normal'. The operator may change any of the parameters when the machine is ready. The operator may increment the number of copies, change size. When the parameters are properly set, the operator pushes the start button. With this the machine starts copying. Copying proceeds until all copies are made. Again, the machine becomes ready. Draw the state diagram of this. Include entry, do, exit actions wherever appropriate. **[5]**

b) Elaborate fork and join in the context of activity diagram. Draw the notations of synchronous, asynchronous, return, create object and destroy object messages in the context of sequence diagram. **[5]**

Q5) a) What are the various ways to find system concepts. Write in one sentence each. **[5]**

b) State the steps to prepare the domain class model. **[5]**

OR

Q6) a) What are the questions which should be answered while elaborating a system concept? Describe in one sentence the importance of each. **[5]**

b) State the steps to prepare the application interaction model. **[5]**

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