P4/RT-Ex-06-30

Con. 1945-06.

[REVISED COURSE]

TV-8496

(3 Hours)

[Total Marks : 100

N.B. (1) Question No. **1** is **compulsory**.
    (2) Attempt any **four** questions out of remaining **six** questions.

1. (a) Draw a detailed class diagram for the following scenario.   12
    A product is to be installed to control elevators in a building with m floors. The problem concerns the logic required to move elevators between floors according to the following constraints.
    Each elevator has a set of m buttons, one for each floor. These illuminate when pressed and cause the elevator to visit the corresponding floor. The illumination is canceled when the elevator visits the corresponding floor.
    Each floor, except the first floor and top floor has two buttons, one to request and up-elevator and one two request a down-elevator. These buttons illuminate when pressed. The illumination is canceled when an elevator visits the floor and then moves in the desired direction.

   (b) Write a set of test cases (i.e. specific sets of data) that you feel would adequately test the following   8
program.
    The program reads three integer values from a card. The three values are interpreted as representing the lengths of the sides of a triangle. The program prints a message that states whether the triangle is scalene, isosceles or equilateral.

2. (a) The direction control for some of the first toy electric trains has accomplished by interrupting the   10
power to the train. Prepare state diagram for the headlight and wheels of the train, corresponding to the following scenario.
    Power is off, train is not moving.
    Power is turned on, train moves forward and train headlight shines.
    Power is turned off, train stops and headlight goes out.
    Power is turned on, headlight shines and train does not move.
    Power is turned off, headlight goes out.
    Power is turned on, train runs backward with its headlight shining.
    Power is turned off, train stops and headlight goes out.
    Power is turned on, headlight shines and train does not move.
    Power is turned off, headlight goes out.
    Power is turned on, train runs forward with its headlight shining.

   (b) What is a Use Case Diagram ? And when should we use it ?   10

3. (a) Prepare an object diagram for the following scenario.   12
    A graphical document editor that supports grouping, which is a concept used in variety of graphical editors/ Assume that a document is composed of several sheets. Each sheet contains drawing objects, including text, geometrical objects, and groups. A group is simply a set of drawing objects, possibly including other groups. A group must contain at least two drawing objects. A drawing object can be a direct member of at most one group. Geometrical objects include circles, ellipses, rectangle, lines and squares.

   (b) Explain component diagram and its use with example.   8

4. (a) Draw a collaboration diagram for the scenario described in Qu-1 :(a).   12
   (b) Explain deployment diagram and its use with example.   8

5. (a) Name and explain in short five Booch diagrams.   10
   (b) What is model ? Why do we need to model a problem ? Briefly describe static model and dynamic   5
model.
   (c) What is the difference between uses and extends ?   5

6. (a) List the object oriented design axioms and corollaries.   10
   (b) Explain with example modeling an association as a class.   5
   (c) How is software verification different from validation ?   5

7. (a) What are the phases of OMT ? Briefly describe each phase.   10
   (b) What the purpose of analysis and why is analysis a difficult task ?   5
   (c) What are guidelines for developing effective documentation ?   5