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MCA – 412

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1449 **Roll No.** | | | | | | | | | | |

MCA

(SEM IV) EVEN SEMESTER THEORY EXAMINATION, 2009-2010

OBJECT ORIENTED SYSTEM

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt ALL questions.*

*(ii) All questions carry **equal** marks.*

1. Attempt **any two** parts of the following :

(a) Explain with a suitable example modeling an association as a class.

(b) Differentiate between scenarios and event traces with a suitable example.

(c) Prepare a data flow diagram for computing the volume and surface area of a cylinder. Inputs are the height and radius of the cylinder. Outputs are volume and surface area. Discuss several ways of implementing the data flow diagram.

2. Attempt **any two** parts of the following :

(a) How does String class differ from StringBuffer class in Java ?

(b) Write a Java program for matrix Multiplication.

(c) How is Java's coordinate system organized ? Describe the three ways of drawing polygons.

3. Attempt **any two** parts of the following :

(a) A problem arises when several independent systems need to identify the same object. For example, department of motor vehicles, an insurance company, a bank, and a police may wish to identify a given motor vehicle. Discuss the relative merits of using the following identification methods :

(i) Identify by its owner

(ii) Identify by attribute such as manufacturer, model, and year.

(b) A simple digital watch has a display and two buttons to set it-the A button and B button. The watch has two modes of operation, display time and set time. In the display time mode, hours and minutes are displayed, separated by flashing colon. The set time mode has two sub modes, set hours and set minutes. The A button is used to select modes. Each time it is pressed, the mode advances in the sequence: display, set hours, set minutes, display etc. Within the sub modes, the B button is used to advance 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.

(c) Prepare a dataflow diagram for computing the mean of a sequence of input values. A separate control input is provided to reset the computation. Each time a new value is input, the mean of all values input since the last reset command should be output. Since you have no way of knowing how many values will be processed between resets, the amount of data storage, which you use should not depend on the number of input values. Detail your diagram down to the level of multiplications, divisions and additions.

4. Attempt **any two** parts of the following :

(a) Assume that a bank maintains two kinds of accounts for its customers, one called savings account, and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that store customer name, account number and type of account. From this, derive the class Curr-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks :

(i) Accept deposit from a customer and update the balance,

(ii) Display the balance,

(iii) Compute and deposit interest,

(iv) Permit withdrawal and update the balance,

(v) Check for the minimum balance, impose penalty, if necessary, and update the balance.

(b) What is an applet ? What is a local applet ? What is a remote applet ? How do applets differ from application programs ?

(c) What is a thread ? What is the difference between multiprocessing and multi threading ? What is to be done to implement these in a Java program ?

5. Attempt **any two** parts of the following :

(a) Write applets to draw the following shape :

(i) Square inside a circle.

(ii) Circle inside a square.

(b) Describe the different stages in the life cycle of an applet. Distinguish between init() and start() methods. Develop an applet that receives three numeric values as input from the user and then displays the largest of the three values on the screen.

(c) What is the difference between suspending and stopping of a thread ? Describe the complete life cycle of a thread. Develop a simple real life application program to illustrate the use of multithread.

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