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

PAPER ID : 1407 Roll No. | | | | | | | | | | |

MCA

THIRD SEMESTER EXAMINATION, 2004-2005

OBJECT ORIENTED PROGRAMMING AND C++

Time : 3 Hours *Total Marks : 100*

Note : *Attempt **ALL** the questions.*

1. Attempt ***any four*** parts of the following : – **(5x4=20)**

(a) What are inline functions ? Explain with example.

(b) What is reference ? How it is similar and/or different to Pointers ?

(c) What are general rules for overloading functions in C++.

(d) What are virtual functions ? Explain how run-time polymorphism can be achieved using them ?

(e) What is 'this' operator ? Explain its distinct use ?

(f) Explain the hierarchy for C++ STREAM Classes.

2. Attempt *any two* of the following :– **(10x2=20)**

(a) Overload '<' operator to find out whether a given date is less than or not with respect to another given date.

(b) Write a program 'AREA' in C++, which calculates area of a circle, square, rectangle, triangle depending upon user's choice. Use function overloading.

(c) Write a program in C++, which asks for 'system-in' and 'system-out' time from user and calculates 'system-use-time'. Use classes and objects.

3. Attempt *any two* of the following :– **(10x2=20)**

(a) A directory file contains information about files in a directory, including both ordinary files as well as directory files.

Prepare an object diagram which models directory files and ordinary files.

(b) Prepare an object diagram for the Dining-Philosopher's Problem. There are 5 Philosophers and 5 forks around a circular table. Each philosopher has access to two forks on either on the table or in use by one philosopher. A philosopher must have 2 forks to eat.

(c) Prepare a portion of an object diagram for a library book check out system that shows the date a book is due and the late charges for an overdue book as derived objects.

4. Attempt *any two* of the following :– **(10x2=20)**

(a) Prepare a states diagram for making a transaction in an ATM machine.

(b) Prepare states diagram for a Twin-Tub, semi-automatic washing machine having usual controls as follows :

(i) A Timer for Wash/Rinse.

(ii) A Timer for Drier.

(iii) A Drain Selector.

(iv) A Water inlet Selector (Wash/Drier)

(v) A Program Selector (Wash and/or Dry)

(c) What are Nested states Diagrams ? Why they are useful ? Explain with suitable example.

5. Attempt ***any two*** of the following :– **(10x2=20)**

(a) Prepare a Data Flow Diagram for computing the volume and surface area of a cylinder. Inputs are height and radius of the cylinder outputs are volume and surface area. Discuss several ways to implement the DFD.

(b) Prepare a DFD for Payroll system in a company.

(c) Explain the following with reference to Data Flow Diagrams :

(i) Actors

(ii) Data stores

(iii) Control flows

Give suitable examples for the above.

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