Printed Pages : 3 **MCA-305**

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

PAPER ID : 1433 Roll No.

M.C.A.

(SEM. III) EXAMINATION, 2008-09

OBJECT ORIENTED SYSTEMS AND C++

Time : 3 Hours] *[Total Marks : 100*

Note : *Attempt **all** questions.*

1 Answer any **four** parts : **5×4=20**

(a) Differentiate between the terms object model and object design with example.

(b) What do you mean by model ? What are the purposes served by using models ? - Explain.

(c) Prepare a class diagram from the following instance diagram :

(d) Define the terms multiplicity and quantification with suitable example.

(e) Write a short note on abstract classes.

(f) Explain pattern and metadata with example.

2 Answer any **two** parts : 10×2=20

(a) Define events and states. Also give the scenario and event trace for a phone call, with complete diagram.

(b) Define the following with example :

(i) Controlling operations

(ii) State generalization.

(c) Write short notes on the following :

(i) Aggregation concurrency

(ii) Entry, Internal and Exit actions.

3 Answer any **two** parts : 10×2=20

(a) Define DFD. Draw a DFD for the automation of training and placement office of any college. Make suitable assumptions yourself and explain them clearly.

(b) Using the quadratic formula as a starting point, prepare a data flow diagram for computing the roots of the quadratic equation $ax^2 + bx + c = 0$. Real numbers a, b and c are inputs. Outputs are values of $X = R1$ and $X = R2$, which satisfy the equation. Remember, $R1$ and $R2$ may be real or complex depending on the values of a, b and c. The quadratic formula for $R1$ and $R2$ is $\left(-b \pm SQRT\left(b^2 - 4ac\right)/2a\right)$.

(c) Define the following context to functional model :

(i) Nested dataflow diagram

(ii) Actors with suitable example.

4 Answer any **two** parts : **10×2=20**

(a) Write a code in C++ to implement the sort operation on the class integers. Make suitable assumption yourself, if necessary.

(b) Write a code in C++ to implement the method. The insert method takes a new node from the class node and insert that in a linked list.

(c) Explain any two of the following concepts in C++ by suitable example :

(i) Encapsulation

(ii) Polymorphism

(iii) Virtual functions.

5 Explain any **two** of the following in detail :

(a) Object oriented guidelines

(b) SA/SD approach

(c) Comparison between OMT and Jackson structured development methodology.

Back Paper

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Printed Pages : 3 **MCA-233**

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

PAPER ID : 1407 Roll No.

M.C.A.

(SEM. III) EXAMINATION, 2007-08

OBJECT ORIENTED PROGRAMMING & C++

Time : 3 Hours] *[Total Marks : 100*

*Note : (1) Attempt **all** questions.*

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

1. Attempt any **four** of the following : **5×4=20**

(a) Prepare a class diagram from the instance diagram **(fig.1)**

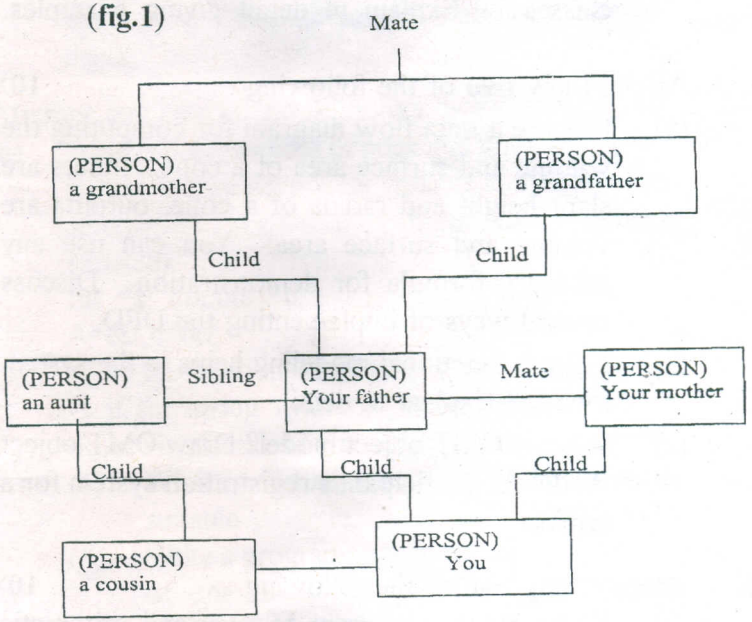

Fig. 1

(b) What is multiple inheritance? Explain using suitable example.

(c) Explain aggregation, association with example.

(d) Draw an object model defining abstract and concrete class.

(e) Explain instantiation using an example.

(f) How meta data is different from data?

2. Attempt any **two** of the following : **10×2=20**

(a) Describe events and states. How a state diagram is prepared ? Explain taking suitable examples.

(b) With the help of suitable state diagrams explain :

(1) Aggregation concurrency

(2) Concurrency within object.

(c) How object diagrams are prepared from object classes ? Explain in detail giving examples.

3. Attempt any **two** of the following : **10×2=20**

(a) Prepare a data flow diagram for computing the volume and surface area of a cone. Inputs are slant height and radius of a cone, outputs are volume and surface area. You can use any arbitrary formula for demonstration. Discuss several ways of implementing the DFD.

(b) How is functional modeling helps in the system model ? Explain in detail.

(c) What is OMT object model? Draw OMT object model for participant's registration system for a seminar.

4. Attempt any **two** of the following : **10×2=20**

(a) Write a C++ program to overload arithmetic operators for manipulating two vectors.

(b) Raising a number 'n' to power 'p' is the same as multiplying 'n' by itself 'p' times. Write a function called power( ) that takes a double value for 'n' and an input value for 'p' and returns the result as double value. Use a default argument of 2 for 'p' so that if argument is omitted, the number will be squared. Write a main ( ) program to exercise this function.

(c) Write a program in C++ to read a list containing item name, item code and cost interactively and produce a three column output as shown below :

NAME	CODE	COST
Close-up	1001	47.40
Colgate	908	40.20
.....	.....	.....
.....	.....	.....

Note that the name and code are left-justified and the cost is right-justified with a precision of two-digits.

Attempt any **two** of the following : **10×2=20**

(a) What is dereferencing of pointers? Write a program to dereference the pointer variable in the following statements (print value pointed to by pointer variable)

Int *a; double *b;

A=&I;b=&f;

(b) Write the function locate (s, pattern) which returns -1 if the string "pattern" does not exist in 's', otherwise returns location at which it is found.

(c) (1) What is virtual base class? Explain with suitable example.

(2) Write a program, which copies the contents of one file to a new file by removing unnecessary spaces between words.

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

PAPER ID : 1433 Roll No.

M.C.A.

(SEM. III) EXAMINATION, 2007-08

OBJECT ORIENTED SYSTEMS AND C++

Time : 3 Hours] *[Total Marks : 100*

Note : Attempt **all** the questions.

1 Attempt any **four** parts of the following : 5×4=20

(a) What are the advantages of object oriented paradigm over procedural paradigm?

(b) What is the difference between data abstraction and data encapsulation ?

(c) Define the following :

(i) Meta-data

(ii) Information hiding

(d) Explain different Object Modelling Technique (OMT) models in brief.

(e) Prepare a portion of an object diagram for a library book checkout system that shows the date when a book is due and the late charges for an overdue book.

(f) Explain aggregation with suitable example.

2 Attempt any **four** parts of the following : 5×4=20

(a) Define the following with suitable example :

(i) Events and states

(ii) Conditions

(b) Draw and explain state diagram of a Traffic Light Controller.

(c) What do you mean by nested state diagram ? And explain its importance in brief.

(d) Describe Magic state and dead loop in state diagrams with examples.

(e) Place the following event classes into a generalization hierarchy with inheritance of event attributes:
pick operation, character input, line pick, circle pick, box pick.

(f) Describe aggregation concurrency with example.

3 Attempt any two parts of the following : 10×2=20

(a) Draw a DFD for result preparation automation system of B.Tech. courses of any university. Clearly describe the working of the system. Make suitable assumptions yourself and expain them clearly.

(b) 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.

(c) Write short notes on the following in context of functional model :
(i) control flow
(ii) constraints
(iii) derived attribute
(iv) actor.

4 Attempt any two parts of the following : 10×2=20

(a) There are different kinds of employees in an organisation. They are permanent and temporary. All employees have a name and address. Permanent employees have an employee number. Temporary workers are of two kinds regular and ad-hoc. Ad-hoc employees are appointed for a fixed period. The daily wagers are hired for a fixed amount. Write different classes and the constructors using C++.

(b) Write a program in C++ to add, multiply, divide and subtract two complex numbers using the concept of operator overloading.

(c) Write short notes on the following in context of C++ :
   (i) friend function
   (ii) file handling in C++
   (iii) virtual function
   (iv) extended classes.

5 Attempt any two parts of the following : 10×2=20

(a) Differentiate software engineering methodology and OMT methodology. Describe the concepts and notations that support the OMT methodology.

(b) Describe structured analysis/structured design (SA/SD) approach in detail.

(c) Discuss the Jackson Structured Development methodology (JSD) and compare it with OMT.

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

PAPER ID : 1433 Roll No. | | | | | | | | | | |

MCA

THIRD SEMESTER EXAMINATION, 2006-07

OBJECT ORIENTED SYSTEMS AND C++

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt **ALL** questions.*

(ii) All questions carry equal marks.

(iii) Be precise in your answer.

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

(a) What is object oriented programming ? List the various advantages and disadvantages of object oriented programming.

(b) Using the object modelling technique, accept a numeric value by the user and calculate its factorial value.

(c) Design a template class for sorting elements.

(d) What is "operation over-riding" ? Explain the different reasons for implementing over-riding.

(e) Prepare a list of objects that you would expect each of the following systems to handle.

(i) A Telephone Answering Machine.

(ii) A Catalog store order entry system

(f) Define the following terms, giving at least one example of each :

(i) Inheritance (ii) Data abstraction

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

(a) What is dynamic modelling ? Explain the purpose of dynamic modelling.

(b) What do you understand by scenarios and event traces ?

(c) Explain the state generalization with the help of suitable example.

(d) What is the role of nested state diagram in dynamic modelling ?

(e) Explain the various methods of Synchronization of Concurrent activities in dynamic modelling.

(f) What is Polymorphism ? Give the need of polymorphism, with the help of an example.

4.

Attempt *any two* parts of the following : **(10x2=20)**

(a) What do you mean by data flow diagram ? Prepare a DFD for computing the area of a circle. Assume that the area calculation is a polymorphic function of the class "circle" that inherits other properties from class "shape". Create the class declarations of the "circle" class, indicating the inherited properties, constructors/deconstructors and any other data members and member functions.

(b) Draw object diagram in which each of the following conventional data structures is replaced by one or more association :

(i) Stack (ii) Binary Tree

(c) For each of the following systems

(i) Remote controlled machine

(ii) Electronic type writer

Identify the Relative importance of three aspects of modelling

(1) Object modelling

(2) Dynamic modelling

(3) Functional modelling

Explain your answer.

Attempt *any two* parts of the following : **(10x2=20)**

(a) What is a Virtual function ? Why do we need virtual function ? When do we make a virtual function "Pure" ? What are the implications of making a function a pure virtual function ?

(b) What do you mean by dynamic initialization of objects ? How is dynamic initialization of objects achieved ? Also discuss the importance of constructor and destructor.

(c) Design a Singly Linked List Class. The class should include all functionalities relating to a singly linked list like creation, insertion, deletion, printing of elements etc.

Observe the following while designing class :

(i) Clearly indicate Public and Private elements.

(ii) Design constructor and explain their purpose .

(iii) Identify data structures and methods which can be inherited.

(iv) Implementation should be in C++.

Attempt *any two* parts of the following : (10x2=20)

(a) What do you understand by object modelling ? Draw OMT object model for Hospital Information System.

(b) Write a Pseudo-code, including class declarations and methods, to implement the following in any object-oriented language.

- One-to-one association which is traversed in both direction.

(c) What is Jackson Structured Development Methodology ? Compare it with Structured Analysis/Structured Design Technique.

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