INDIAN INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MATHEMATICS
MID-AUTUMN SEMESTER EXAMINATION- 2015
TIME : 2 HOURS   FULL MARKS : 30
Subject : Object Oriented System Design / Object Oriented Programming
(MA61001 + MA 31011+ MA60047)
No of students : 83

ANSWER ANY THREE QUESTIONS
Q No. 4 is Compulsory

Q1.(a) What do you mean by object, dynamic and functional models of OOP? State the Video Rental System and draw diagrams for these models for it.

Object:- Nodes:object, Edges:- Relation b/w objects   (3+3= 6)
Dynamic:- Nodes:state, Edges:- Transitions
Functional:- Data flow graph, order of execturion

(b) Distinguish between procedural and object oriented programming languages by drawing tables for their advantages and disadvantages. List at least six benefits of OOP approach in program development.

(3 + 1 = 4)

Q2. (a) Explain the term Modularity, Abbreviation, Concepts of information hiding with the recognition of structures, links, link attributes and associations by giving one example for each of them.

(6)

Objects is an-entity which has code and data. It encapsulates some or all attributes and functionalities

(b) What do you mean by objects in OOP? Explain the roles played by these objects by giving suitable examples. List and explain the necessary steps in an object oriented software development process.

(2+2= 4)

Aggregation means realtionships, this means a part of assembly representing the sequence

Q3. (a) Explain the terms Generalization, Aggregation and Inheritance. What notations are used for them? Show suitable examples for each of them.

In which base class inherits members and properties from the super class

(5)

Generalisation:- Common function from various classes put in one

(b) Write a C++ and a Java program to sort n integers in increasing order. Measure their time complexities.

(5)

Q4. (a) What will be the value of x after execution of the following if-else statement if x and y are integer variables containing the values 9 and 3 respectively

if (x < y) if (y > 0) x = x * y; else if (y < 4) x = x- y ;
what about if x and y contains 3 and 9 respectively ?

(2)

9 3
27 9

(b) What is the difference between Call by address and Call by reference?

Call by add we pass adress, and call by reference we pass a copy of the value (2)

(c) Consider the following data types
signed char, signed short, signed int, unsigned char, unsigned int and unsigned long.
Draw a graph where a type points to another type if all values of the first can be represented as the values of the second.

(2)

(d) Explain the meaning of the following statements
(i) int (* p (char *)) [10] ; p is a pointer pointing towards a function which takes pointer to character as input and outputs and int array of 10 size
(ii) int p (char (* a) [ ]) ;

p is a function which takes a 2-D array of character as input and returns and int value (2)

(e) What the following statements does?
(i) *ptr + = 1;   Increases the value of ponter by one
(ii) *ptr++;

(2)

Increase the address value by the bytes(pointer_type)

*****END******