Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

(A Constituent Institute of Manipal University)
Manipal – 576 104

FIFTH SEMESTER B.TECH.(BME) DEGREE END SEM EXAMINATION NOV/DEC 2015
SUBJECT: OBJECT ORIENTED PROGRAMMING (BME311)
(REVISED CREDIT SYSTEM)
December 07, 2015, 2PM-5PM

TIME: 3 HOURS **MAX. MARKS: 100**

Instructions to Candidates

1. **Answer any FIVE full questions.**
2. **Draw labeled diagram wherever necessary**

1. (a) Explain the following concepts associated with object oriented programming:
   i) Encapsulation
   ii) Data hiding — 08

   (b) Specify a class "Ortho" with a public data member "DEPT_NAME" (department name), and a private data member "IN_PATIENT" (inpatient name). Define a constructor and a member function. Create the objects of the class "ORTHO1" and "ORTHO2", and explain the access of the data members. — 08

   (c) What is *compile time polymorphism*? Explain with an example. — 04

2. (a) The declaration pertaining to the member-functions having the same name, with the different parameter list: *float add (int x, float y); and int add (int x, int z)*. Explain the compiler action for the following function-calls: add (4,6); and add (7, 7.0); — 06

   (b) Explain the mechanism associated with "passing of the parameters", to a function by the address of variable. How is this technique different from passing "by value"? — 06

   (c) The ***class-X,*** as members has a private and a protected data. It has two public functions (fx1 and fx2). The ***class-Y***, a friend of ***class-X,*** has two public member functions (fy1 and fy2). Another ***class-Z***, inherited from ***class-X,*** has two public member functions (fz1 and fz2). Explain the visibility of the private and protected members of the base class, in the ***class-Z*** and ***class-Y***, when the derivation mode is protected. — 08

3. (a) Can a member function of class be declared as a friend of another class? If yes, give an example and justify. If not, give the reason. — 06

(b) Explain the following forms:

i) Multiple inhertance
ii) Hierarchical inheritance
iii) Multilevel inheriatnce

06

(c) An educational institution maintains a database consisting of a number of classes, whose hierarchical relationships are shown in figure-1. Specify all the classes and define functions to retrieve individual information as and when required.

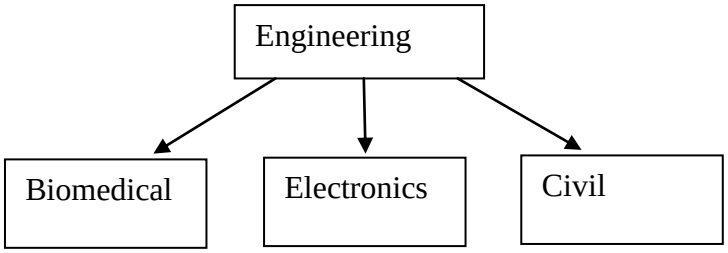

Figure 1

08

4. (a) What is meant by "operator overloading"? Define an operator function "to add three complex numbers". Alternatively, define a friend function to perform the same operation. 10

(b) Give the details of data-type conversion from one class type to another. Discuss how this concept helps in handling a point in the rectangular co-ordinate system and to convert it into polar system. (4+6)

5. (a) What are "file associated pointers"? Explain their significant role during file associated data transfer. 06

(b) What is a "virtual function"? The class "Student" is a base class and the class "Result" is a publicly derived class, derived from "Student". If both the base class and derived class have the member function named "display ()", describe how the compiler resolves the ambiguity while using the base pointer to access the objects of the base or derived classes. 08

(c) Describe the similarity and dissimilarity between the static member function and member function of a class, with their syntax details. 06

6. (a) Explain the significance of the following file-mode parameters:

i. ios::nocreate
ii. ios::ate
iii. ios::in| ios::out

06

(b) Consider two integer variables: a, b; and int $x = a - b$; $c = a/x$. What is the peculiar situation arises if "c" is calculated with a value of "$a = b$", during runtime? Explain how such a situation is managed with a synchronous technique. 08

(c) What is "early binding"? Explain the concept with an example. 06