MODEL QUESTION
FIFTH SEMESTER BTECH DEGREE EXAMINATION OCTOBER 2015
(2013 SCHEME)
13. 504 OBJECT ORIENETD PROGRAMMING & NUMERICAL METHODS (N)

Branch: Mechanical Engineering (Industrial Engineering)

Time: 3 Hours   Maximum: Marks 100

Instructions: Answer all questions from Part-A and four full questions from Part B choosing not more than one full question from each Module.

PART A

1. Explain the exception handling system used in object oriented programming?
2. Explain dynamic initialization of a variable with an example?
3. Explain the rate and order of convergence of numerical methods?
4. We know that a private member of a base class is not inheritable. Is it anyway possible for the objects of a derived class to access the private members of a base class. If yes how?
5. What does polymorphism means in c++ language?
6. Why do we need virtual functions?

7. When do we use the protected visibility specifier to a class member?
8. What are pointes and their uses in object oriented programming language?
9. Derive the finite difference formula for Laplace equation?
10. Expalin the significance of abstract class in C++?

(10X2=20)

PART B
Answer one full questions from each module
Module 1
11.   Explain the need for Object Oeriented approach. Why modern concepts are implemented in Object Oriented Programing. Expalin with the help of suitable examples?

20

12. a) Expalin the concept of Function over loading with the help of a class called shape in which we have to find the area of circle, rectangle,square,triangle. Use a switch case statement to select the appropriate shape.   10

b) Create two classes DM and DB which store the value of distances. DM stores distances in meters and centimetres and DB in feet and inches. Write a programme to read the values for class objects and and add one object of DM with another object of DB. Use a friend function to carry out these operation.

10

Module 2
13.
 a) What is meant by operator overloading? Create a class string and create objects of this class

namely S1,S2,S3. Write a program to

i) concatenate strings using + operator ie S3=S1+S2

ii)compare strings using '= =' operator   10

b) For the above programe intialize the string variables and sort the names in ascending and descending order using a function called sort?   10

14. Create a Matrix class and intialize two 3x3 Matrix using constructors. The class contains the member functions like addition, subtraction and multiplication. Functions should take the arguents and return the result. Use constructors to intialise the variables   20

Module 3

15.Assume that a bank maintains two kinds of accounts for customers one called as savings account and the other as current account. The savings account provides the compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name , account number and type of account. From this derive the classes curr_acct and sav_acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:

i) accept deposit from a cusomer and update the balance

ii)display the balance

iii)compute deposit and interest

iv)permit withdrawal and update the balance

v) check for minimu balance and impose penalty.   20

16) a) Using C++ write a program to accept roll no, name, mark1, mark2, mark3, mark4,mark5. Find the grade point average using the concept of class in which the student should be declared as class. This class should initialize the variables with dynamic memory allocation to accept the details of 50 students. Whenever the user enters the roll number of a particular student the details of the student and his GPA should be published.

                10

b) Explain the concept of error handling methods and use of abstract classes with the help of suitable examples   10

Module 4

17.a)   Using lagrange's interpolation find f(8.5) for following data:

    x: 7 8   9   10
    f(x)   3 1   1   9   10

   b) Find the number of students who obtained less than 45 marks using following data using Newton's formula

Marks	30-40	40-50	50-60	60-70	70-80
No.of students	31	42	51	35	31

                                                                    10

18) Implement a suitable programme for the above 2 problems?   20