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B. E. (Fourth Semester) Examination Nov.-Dec. 2021

(New Scheme)

(Specialization : Information & Technology)

(Information Technology Engg. Branch)

OBJECT ORIENTED CONCEPTS
& PROGRAMMING using C++

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

*Note : Attempt all questions. Part (a) of each
question is compulsory & carries 2 marks.
Attempt any **two** parts from (b), (c) & (d) of
each question which carries 7 marks each.*

Unit-I

1. (a) Define the term data hiding and encapsulation in the
context of OOP. Give example.

(b) Describe comparison between procedural programming paradigm and object-oriented programming paradigm.

(c) Write a function power() to raise a number m to a power n. The function takes a double value for m and integer value for n, and return the result correctly. Use a default value of 2 for n to make the function to calculate squares when this argument is omitted. Write a main that gets the value of m and n from the user to test the function.

(d) Explain function overloading. Illustrate a program to overload swap ( ) to perform the swapping of :

   (i)   Two integer variables

   (ii)   Two floating point variables

   (iii)   Two character variables

Unit-II

2. (a) What are bit fields?

   (b) What is friend function? How friend function works as a bridge between two classes? Support four answer with example.

(c) Write a program that adds two distances (objects) len 1 and len 2 to produce third distance (object) total using returning of object.

(d) Write a C++ program using classes and objects to simulate result preparation system for 10 students. The data available for each student includes roll no, name and marks in 3 subjects. The percentage marks and grade are to be calculated from the above information. The percentage marks and the grade is calculated as follows :

Percentage marks	Grade
<50	'F'
>=50<60	'D'
>=60<75	'C'
>=75<90	'B'
>=90<100	'A'

Unit-III

3. (a) How memory is allocated and de allocated dynamically in C++? Give example.

   (b) What is this Pointer? Write a program to show how this pointer works in situation when local variable's name is same as member's name.

(c) Explain the types of constructor. Write a program to show how constructors are overloaded in C++.

(d) Explain the type conversion from basic type to class type and class type to basic type with example.

Unit-IV

4. (a) Write a program to show how constructors and destructors are executed in inheritance.

(b) Write a C++ program to overload binary operator using friend function.

(c) Explain the various types of inheritance? Write a program to show how ambiguity is resolved in multipath inheritance.

(d) Differentiate between overloading and over riding. Write a program to show how run time poly-morphism is acheived in C++.

Unit-V

5. (a) Write statements using seekg() to achieve the following :

(i) To move the pointer 15 position background from current position

(ii) To go to byte number 50 in the file

(b) Create a base class Shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called Triangle and Rectangle from the base class Shape. Add to the base class, a member function get_data() to initialize base class members and another function display_area() to compute and display the area of figures. Make display_area as a pure virtual function ad redefne this function in the derived classes to suit their requirements. Using these three classes design a program that will accept dimensions of a triangle and rectangle interactively and display the area.

(c) Explain Generic Programming? Write a function template to find maximum of two numbers using function template.

(d) What is an exception? Write a program which divides one number by another. The program should raise an exception if there is a division by zero conditions. The exception should be handled by 'try' and 'catch' block.