

**MAR-21-210040****B. Tech. EXAMINATION, March 2021**

Semester III (CBCS)

OBJECT ORIENTED PROGRAMMING USING C++  
(CSE, IT)

CS-302

Time : 3 Hours

Maximum Marks : 60

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Attempt Five questions in all, selecting one question from each Sections A, B, C and D. Q. No. 9 is compulsory.

**Section A**

1. An electricity board charges the following rates to domestic users :

Units consumed	Tariff
For the first 100 units	Rs. 5 per unit
For the next 200 units	Rs. 10 per unit
For the next 300 units	Rs. 15 per unit

Write a C++ program using class to read the names of users and number of units consumed and print out the charges (in Rs.) with names. Compare the procedural programming paradigm with object-oriented programming paradigm. **10**

2. Write a program to add, subtract, multiply and divide two complex numbers using objects and classes. Explain the features of object-oriented programming. **10**

**Section B**

3. Declare a class called item having data members item\_code, item\_name, cost and discount. Derive two classes from class item, namely employee and customer. The class employee has data members like employee\_code, employee\_name and amount. The class customer has data members like customer\_name and amount. Define the following functions for -  
initializing data members. - displaying the values of data members. - computing amount to be paid for a purchased item. Also define function main to create objects of both derived classes and to show usage of above functions. **10**

4. What is Operator Overloading concept in classes ? Create a class distance which has data in feet and inches and add two distances by overloading "+" operator with member functions. Write down the code for whole program. 10

### Section C

5. Briefly discuss memory allocation process in C++ language. With the help of an example, explain how pointers can be used to dynamically allocate space for two-dimensional array. 10
6. What is "this" pointer and when do we use "this" pointer ? What are its applications ? State the difference between virtual functions and pure virtual functions. Explain the concept of polymorphism with suitable example. 10

### Section D

7. (a) Write template function MIN that return smallest in an array of N Numbers. 4
- (b) Use File pointers to perform the following tasks :
- (i) To move the pointer by 10 positions forward from the beginning.
  - (ii) To move the pointer three position backward from the end
  - (iii) To move the pointer 5 positions from current positions. 6

8. Explain the advantages of using templates. Write a program to create one text file "Country" which has country names and another file "Capitals" which has capital names of those countries. Merge the "Capital" file into "Country" using the append mode. 10

### (Compulsory Question)

9. (a) Distinguish between the following two statements :
- Time T2(T1); Time T2 = T1;
- T1 and T2 are two time objects.
- (b) Differentiate between early binding and late binding.
- (c) What is exceptional handling ? Explain how an exception is handled using try catch block and throw statement ?
- (d) Explain the need of constructor and destructors in C++ programming.
- (e) What are the various advantages of using friend function in classes ? 5×4=20

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