U.S.N

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Third Semester, B.E. - Information Science and Engineering
Semester End Examination; March - 2021
Object Oriented Programming with C++ and Java

Time: 3 hrs   *Max. Marks: 100*

Note: **I) PART - A** *is compulsory.* **Two** *marks for each question.*
          II) PART - B: *Answer any* **Two** *sub questions (from a, b, c) for Maximum of* **18 marks** *from each unit.*

Q. No.	Questions	Marks
	I : PART - A	**10**
I a.	State the purpose of reference variable? Give an example.	2
b.	How does inheritance influence the size and functionality of derived class objects?	2
c.	Differentiate between virtual destructors and virtual constructors.	2
d.	Define binary file and give an example.	2
e.	State the purpose of "*this*" keyword used in Java.	2
	II : PART - B	**90**
	UNIT - I	**18**
1 a.	Define function prototyping and write its general syntax. Why should default values are to be given to function argument in the function prototype? Explain with an example.	9
b.	Explain the following with a C++ program: i) Function overloading ii) Inline function	9
c.	Demonstrate the following with a C++ program: i) Passing objects to functions ii) Returning objects from functions	9
	UNIT - II	**18**
2 a.	Illustrate how "*new*" and "*delete*" operators manage the memory allocation/de-allocation dynamically with a C++ program?	9
b.	Explain the following with a C++ program: i) Zero argument constructor ii) Parameterized constructor	9
c.	Write a C++ program to create a class called STUDENT with data members USN, Name and Age. Using inheritance, create the class called UGSTUDENT having fields a semester, fees and stipend. Enter the data for at least 5 students. Find the average age of all UG students.	9

UNIT - III   18

3 a. Define dynamic polymorphism and discuss how dynamic polymorphism is achieved using virtual functions with an example?   9

   b. With a C++ program, explain how we can overload the Increment and Decrement operators (Prefix and Postfix)?   9

   c. Write a C++ program to create a class called STACK using an array of integers. Implement the following operations by overloading the operators '+' and '--':

    i) *s1 = s1 + element*; where *s1* is an object of the class STACK and *element* is an integer to be pushed on the top of the stack

    ii) *s1 = s1--*; where *s1* is an object of the class STACK, '--' operator pops the element.   9

    Handle the STACK empty and full conditions. Also display the contents of the stack after each operation, by overloading the << operator.

UNIT - IV   18

4 a. With a neat diagram, explain the library classes that handle streams.   9

   b. What are class templates? What is the need for class templates? How are they created? Create a template for bubble sort function.   9

   c. Explain the C-Style solution for handling errors with examples.   9

UNIT - V   18

5 a. List out the features of Java and explain any three features.   9

   b. List different types of iteration statements in Java and discuss the process of building and running a Java application program.   9

   c. Write a Java program to perform the subtraction of two complex numbers by using the method sub( ) by passing object as a parameter and display the result using method display( ). Initialize the real and imaginary values of the complex number using parameterized constructor.   9

✳ ✳ ✳