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**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**THIRD SEMESTER INTEGRATED M.C.A DEGREE EXAMINATION (S), MAY 2022****(2020 SCHEME)****Course Code: 20IMCAT205****Course Name: Introduction to Object Oriented Programming****Max. Marks: 60****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. How are data and functions organized in object oriented programs?
2. Explain the access methods used in object oriented programming.
3. State whether the following statements are TRUE or FALSE.
  - i. Constructors, like other member functions, can be declared anywhere in the class.
  - ii. Constructors do not return any values.
  - iii. Destructors never take any argument.
4. Discuss the use of parametrized constructor.
5. When do we make a class virtual?
6. Explain abstract class with suitable example.
7. What is polymorphism? How is polymorphism achieved at compile time and run time?
8. Discuss the differences between void pointer and wild pointer with suitable example.
9. Explain C++ stream. What are the input and output streams?
10. A template can be considered as a kind of macro. What is the difference between them?

**PART B***(Answer one full question from each module, each question carries 6 marks)***MODULE I**

11. a) Explain data abstraction, encapsulation and inheritance (3)  
b) Explain the advantages of OOPs over procedural program. (3)

**OR**

12. a) Explain the concept of classes and objects. Support your answer with suitable example programs. (3)  
b) What are the uses of public, private and protected keywords? (3)

**MODULE II**

13. What are *friend* functions? When is it used? Give a sample program to demonstrate the use of *friend* functions. (6)

**OR**

14. A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed. If it is, then the system displays the book details and requests for the number of copies required. If the requested copies are available, the total cost of the requested copies is displayed; otherwise “Required copies not in stock” is displayed. Design a system using a class called books with suitable member functions and constructors. Use *new* operator in constructors to allocate memory space required. (6)

### MODULE III

15. What is operator overloading? Why is it necessary to overload an operator? Explain with an example. (6)

### OR

16. What are the different forms of inheritance? Give an example for each. (6)

### MODULE IV

17. a) What is a virtual function? Why do we need virtual function? (3)  
b) What does *this* pointer point to? What are the applications of *this* pointer? (3)

### OR

18. Create a base class called 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 shape. Add to the base class, a member function `get_data()` to initialize base class data members and another member function `display_area()` to compute and display the area of figures. Make `display_area()` as a virtual function and redefine this function in the derived classes to suit their requirements. Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively, and display the area. (6)

### MODULE V

19. Write a program which reads a text from the keyboard and store it in a file. The program should display the following information on the screen. (6)
- Number of lines
  - Number of words
  - Number of characters

### OR

20. Elaborate on exception handling in C++. (6)

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