

**2111000103040002**  
**B.C.A. S.Y (Sem – III)**  
**Examination November-2023**  
**OOPs & Data Structure**

**Seat No:**

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**[Time: Three Hours]**

**[Max. Marks:70]**

<b>Student's Signature</b>
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- Q.1** Answer Following: (Any Seven) **14**
1. What is abstract class? What is use of it?
  2. What is recursion?
  3. Explain destructor in brief with an example.
  4. What is object? Give one example of it.
  5. Explain static binding in brief.
  6. Explain pure virtual function.
  7. Difference between private and protected specifies.
  8. List out the operators where friend cannot be used.
  9. Convert Infix to prefix:  $A-(B * C/D + E)+F$
  10. When to make function as inline?
- Q.2** Do as Directed.: (Any Two) **14**
- A. What is Inheritance? List out the types of Inheritance. Explain Multilevel inheritance with an example.
  - B. What is constructor? Explain copy and parameterized constructor.
  - C. Differentiate between unary and binary operator overloading.
- Q.3** Do as Directed. : (Any Two) **14**
- A. What is overloading of an operator? When it is necessary to overload an operator?
  - B. What is Object Oriented Programming? Write the difference between OOP and POP.
  - C. Write note on data abstraction and encapsulation.
- Q.4** Do as Directed. : (Any Two) **14**
- A. What is stack? Write algorithms of various stack operations.
  - B. Write an algorithm to convert infix expression in to postfix.
  - C. What is Queue? List out the types of queues. Write algorithms for insertion and deletion in deque.

- Q.5** Do as Directed.: (Any Two) **14**
- A. Explain tower of Hanoi with proper example.
  - B. Design two classes to support following type conversions: Time T12;  
Time T24; T24 = T12: Converts Time 12 to Time24 Write a program to carry out this conversion.
  - C. Write a program to perform insert and delete operation of circular queue