

- N. B. :** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **three** from remaining.

1. (a) Write a recursive method to calculate factorial of an integer number. 5  
(b) Explain Bit-wise operators available in JAVA with example. 5  
(c) Explain how JAVA is platform - independent. 5  
(d) Write a program to find the largest of the three integers accepted from command line. 5
  
2. (a) Write a detailed note on System.arraycopy(). 5  
(b) Write a program to display following pattern :- 5  
    1  
    0 1  
    1 0 1  
    0 1 0 1  
(c) Explain different types of inheritance with example. 10
  
3. (a) With proper example explain the steps to create a package and add a class or interface. 5  
(b) Explain Thread life cycle. 5  
(c) Write a program in JAVA to accept the values of a, b, c and d. 10  
    Calculate and display  $((a*d) + (b*c)) / (b*d)$ .  
    Create user defined exception to display proper message when value of  $(b*d)$  is ZERO.
  
4. (a) What is Vector ? Explain any five methods of Vector. 5  
(b) Explain what are abstract class and abstract methods. 5  
(c) Write a program to find largest and second largest element of an array. 10
  
5. (a) Explain method overloading and method overriding with suitable example. 10  
(b) Write a program to accept a number from command line and to check whether it is Armstrong Number or Not. 10
  
6. Write short notes on (any four) :- 20  
(a) Wrapper classes.  
(b) Life cycle of Applet  
(c) Static members  
(d) Thread synchronization  
(e) Exception handling mechanism.