

(2½ Hours)

[Total Marks: 75]

- N.B. 1) All questions are compulsory.  
 2) Figures to the right indicate marks.  
 3) Illustrations, in-depth answers and diagrams will be appreciated.  
 4) Mixing of sub-questions is not allowed.

**Q. 1 Attempt All. (Each of 5Marks)****(15M)**

(a) Multiple Choice Questions:

- (i) Which of these is correct way of inheriting class A in class B?  
 (A) class B inherits A (B) class B extends A  
 (C) class B inherits class A (D) class B extends class A
- (ii) Static variables are also called as:  
 (A) instance variables (B) object variables  
 (C) special variables (D) class variables
- (iii) Which of the following class can be used to read characters from a file?  
 (A) FileReader (B) ObjectInputStream  
 (C) FileWriter (D) InputStreamReader
- (iv) Which of these methods return description of an exception?  
 (A) getMessage () (B) getException()  
 (C) printException () (D) printMessage()
- (v) Which of these packages contains all the classes and methods required for event handling in Java?  
 (A) java.applet (B) java.awt  
 (C) java.awt.event (D) java.event

(b) Fill in the blanks:

(Long, new, final, setText(), java.net, malloc, Number, static, java.util, getText() )

- (i) \_\_\_\_\_ keyword can be used to prevent method overriding.  
 (ii) \_\_\_\_\_ is a super class of Byte and Short wrapper classes.  
 (iii) \_\_\_\_\_ operator is used to allocate memory for an object.  
 (iv) \_\_\_\_\_ package contains classes and interfaces for network programming.  
 (v) \_\_\_\_\_ method can change the text in a Label.

- (c) Answer in 1 – 2 sentences:
- What is the purpose of final keyword when used with a variable.
  - What is a package?
  - What is meant by serialization?
  - What is purpose of wait() method in multithreading?
  - What is an inner class in Java?

**Q. 2 Attempt the following (Any THREE)**

**(15M)**

- What is type casting? Why is it required? How is it achieved in Java?
- Explain various access specifiers that can be used in Java.
- Explain different ways in which 'super' keyword can be used in Java.
- Differentiate between an interface and a class.
- Create a class **Complex** with the following members:
  - two fields of type double to store the real and imaginary part of the complex number
  - constructor(s) to initialize the complex number
  - method that adds two complex numbers and returns the result
- Create a class **Box** with fields for storing height, width and depth of a box. Write parameterized constructor with values of height, width and depth given as parameter. Add a method for calculating the volume of the Box. From the Box class inherit a class **WeightBox** that adds a field weight to the class. Write an appropriate constructor. In another class write main method to create an object of **WeightBox** and calculate its volume.

**Q. 3 Attempt the following (Any THREE)**

**(15M)**

- What is the purpose of **throw** keyword in exception Handling. Illustrate with an example.
- What do you understand by multithreading? Explain how to create thread using Thread class.
- Explain any two byte-stream classes that can be used for reading content from a file.
- What is the purpose of ServerSocket class? Explain any two constructors and two methods of ServerSocket class.
- Write a program that accepts two numbers a and b as command-line arguments, and calculates a/b. The program should handle an appropriate exception if value of b is 0.
- Write a client-server program that accepts a user name from the client and sends a greeting message 'Hello, <username>' to the client.

**Q. 4 Attempt the following (Any THREE) (15)**

- (a) What is the purpose of CheckboxGroup class in Java? How to use it in AWT programming?
- (b) Explain Set interface and any one of its implementation class.
- (c) Explain the concept of Anonymous inner class. Give example to illustrate.
- (d) What are type wrappers? Explain any 3 methods that can be used with Double class. Illustrate with suitable examples.
- (e) Write a program that displays names of any four operating systems in a list box, and the selected operating system should get displayed in a label.
- (f) Write a program to create an ArrayList containing names of five states of India, and then displays them.

**Q. 5 Attempt the following (Any THREE) (15)**

- (a) Explain the concept of abstract classes in Java.
- (b) What is a string? Explain, with example, the following methods of String class:
  - (i) indexOf()
  - (ii) substring()
- (c) Explain how try-catch keywords are used for exception handling.
- (d) What is thread synchronization? How is it achieved in Java?
- (e) Write a note on Event-Delegation model.