Q. P. Code:

(Time: 2½ hours)

Total Marks: 75

Note - This answer key is just an outline of the expected answers. As most of the syllabus is from reference Book –Core Java 8 for beginners by Vaishali Shah and Sharnam Shah, the answer key is made with reference to the same book, however the students are expected to write the answers from any reference book mentioned in the syllabus.

1.	**Attempt *any three* of the following:**	**15**
a.	What is Java Virtual Machine (JVM)? Explain JVM components. Explanation of JVM (2 marks) JVM Components along with diagram (3 marks) (Page No. 8 and 9 of reference book)	
b.	Explain the following. (i) Autoboxing with example (2.5 marks) Autoboxing is the automatic conversion that the java compiler performs between the primitive data types and their corresponding object wrapper classes. (Page No.67 of reference book) (ii) Conditional operator with example(2.5 marks) Variable x = (expression) ? value if true: value if false (Page No. 79 of reference book)	
c.	Define Identifier. Explain rules for identifiers in java. An identifier is a word that allows referring a java programming element by name.(1 mark) Any 4 rules for identifier(4 marks) (Page No. 41 of reference book)	
d.	List of and explain any five features of java. Each feature 1 mark	
e.	Explain the following methods of String.(1 mark for each method) (i) length() (ii) equals() (iii) charAt() (iv) compareTo() (v) substring() (Page No. 57 of reference book)	
f.	How is main() method of java written? Explain it in detail. public static void main(String args[]) (Page No. 38 of reference book)	
2.	**Attempt *any three* of the following:**	**15**
a.	When do we use switch-case statement? Explain it with example. Switch statement is used to choose and execute one code block from among multiple code blocks for execution. The switch statement is used to replace lengthy if-else if-else statements. Switch statements are used to control program flow by testing a single variable against multiple values (1 mark) (Syntax and example 4 marks)	
b.	List and explain the types of classes in java. 1) Public Class 2) Private Class	

3) Final Class
4) Abstract Class

(Page No. 110 of reference book)

c. What is a Constructor? Explain characteristics of Constructor.
(Definition 1 mark, any 4 characteristics 4 marks)

d. Write a program to illustrate the concept of method overloading.

e. What do you mean by variable arguments? Explain it with example.
Variable argument i.e. Varargs is a feature that allows declaring a method that can accept a variable number of parameters for a given argument. It must be the last argument in the formal argument list.(1 mark)
(any example of Varargs 4 marks)
(Page No 124 of reference book)

f. When do we use ‘foreach’ loop? Explain it with example.
Many times it is required to loop through a collection of objects and do something with each object. This loop allows iterating over arrays and other collection. The foreach loop cycles through a collection of objects such as array, in sequential manner.(1 mark)
(any example 4 marks)

3. Attempt *<u>any three</u>* of the following: **15**

a. Differentiate between classes and Interfaces.

Class	Interfaces
A class can have constructor to initialize the variables.	Interfaces do not have constructor.
A class can implement any number of interfaces but can extend only one class.	Interface can extend any number of interfaces.
In a class, we can only define member function we cannot declare them.	In an interface we can only declare member function we cannot define them.
A class can be instantiated by creating objects.	An interface cannot be instantiated as all methods of interface are abstract.
Members of a class can be public, protected or private.	Members of the interface are always public
Class can contain instance data members.	Interfaces contain final and static data members.

(Any 5 differences 5 marks)

b. What is a package? Write steps to create a package in java.
A package is a technique of organizing classes by grouping them into packages. A class in one package can have same name as a class in another package. Usually a collection of related classes, interfaces ,enumerations and annotations are grouped in a package.(1 mark)
(Steps to create package   4 marks)

c. What is an interface? How can we implement interface in a class?
Interfaces provide support for multiple inheritance in Java. It is a reference type similar to a class that can contain only constants, method signature and nested types There are no method bodies. Interfaces cannot be instantiated. They can only be implemented by classes or extended by other interfaces. An interface itself does nothing. All the action happens inside the class that implements the interface.
(Implementing interfaces   Page No. 157 of reference book)

d. Explain the following with example.
(i) this (ii) super

(Page No. 145 of reference book)

e. Write a program to illustrate the concept of abstract method and abstract class.

f. Write a program to implement multilevel inheritance with default constructor in each class.

```
class  A
 {
    public A()
     {
       System.out.println(“A Constructor”);
      }
  }
class  B extends A
 {
    public B()
     {
      System.out.println(“B Constructor”);
      }
   }
class  C extends B
 {
    public C()
      {
        System.out.println(“C Constructor”);
       }
}

class Test
  {
    public static void main(String args[])
       {
          C obj=new C()

        }
     }
```

4. Attempt *any three* of the following: **15**

a. Write a short note on Exception handling.
(Definition 1 mark, explanation of try-catch- finally block with example 4 marks)

b. Explain life cycle of a Thread.

1) New
2) Runnable
3) Running
4) Blocked
5) Terminated(Dead)

c. How is a Vector different from an array? How can you create a Vector in java.

Vector is a dynamic array which can grow dynamically according to the required need. Vector do not require any fix dimensions like String array or int array. (1 mark)

Creating a Vector (4 marks)

1) Vector V-new Vector();
2) Vector V=new Vector(10);
3) Vector V = new Vector(10,5);

(Explanation of above constructors of vector required)

d. Explain the use of Enumeration datatype in java.

e. Define Stream. Explain how we can write binary data to a file.

Stream – Page No 528 of reference book (1 mark)
Writing binary data- Page No 539 (4 marks)

f. What are the different ways of creating a new Thread in java.

1) Implement Runnable interface(Explanation 2.5 marks)
2) Extend the Thread class (Explanation 2.5 marks)

5. Attempt *any three* of the following: 15

a. Create an applet to display “Java World”, Change the text color to Red.

```
import java.applet.*;
import java,awt.*;

class AppletTest extends Applet
{
   public void paint(Graphics g)
    {
      g.setColor(Color.Red);
      g.drawString(“Java World”,50,100);
     }
 }
```

b. Create an AWT application to create a frame with a Button named “Square”, a Label and a TextField. Enter a number in the TextField .Click of the Button should display square of that number in the Label.

```
class SquareTest extends Frame implements ActionListener
 {
   Button btn;
   Label lbl;
   TextField tf;
        public SquareTest()
         {
                  btn= new Button(“Square’);
                  lbl=new Label();
                  tf=new TextField(10));
                 setLayout(new FlowLayout());
                 add(tf);
                 add(btn);
                 add(lbl);
                 btn.addActionListener(this);
                  setVisible(true);
                  setSize(300,300);
         }
      public void actionPerformed(ActionEvent e)
        {
               int num,sq;
              if(e.getSource()==btn)
```

	num=Integer.parseInt(tf.getText());
	sq=num*num;
	lbl.setText(“ “ +sq);
	}
	public static void main(String Args[])
	{
	new SquareTest();
	}
	}	

c.	What is the use of LayoutManager? Explain GridLayout and BorderLayout.. It is used for placing objects in a container for display on screen without specifying their row, column co-ordinates. They determine how components will be arranged when they are added to a container. (1 mark) Explanation of GridLayout and BorderLayout (2 marks each)	
d.	Explain the following Listener interfaces (i) KeyListener (ii) MouseListener (i) KeyListener methods - keyPressed (), keyReleased(),keyTyped(). (ii) MouseListener methods – mouseClicked(), mouseEntered(), mouseExited(), mousePressed(), mouseReleased().	
e.	Explain Checkbox class along with its constructors in detail. (Page No. 281 of reference book)	
f.	What is the use of Adapter classes? Explain any one Adapter class in detail.	

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