KESHAV MEMORIAL INSTITUTE OF COMMERCE & SCIENCES

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Department of Computer Science

III **B.Sc (MSCs/MPCs) V Semester**

Subject: Programming in Java

Bit Question Bank

PROGRAMMING IN JAVA

I. Multiple Choice Questions (MCQs)

1. **Which of the following is not a feature of Java?** **(b)**
   a) Object-Oriented
   b) Platform Dependent
   c) Robust
   d) Secure

2. **What does JVM stand for?** **(c)**
   a) Java Variable Machine
   b) Java Virtual Method
   c) Java Virtual Machine
   d) Java Verified Machine

3. **Which of the following is used to create an object in Java?** **(a)**
   a) new
   b) create
   c) object
   d) this

4. **What is the default value of a boolean data type in Java?** **(c)**
   a) true
   b) 0
   c) false
   d) null

5. **Which of the following is a valid conditional statement in Java?** **(c)**
   a) if-then
   b) when
   c) switch
   d) case-when

6. **Which loop is guaranteed to execute at least once?** **(c)**
   a) for
   b) while
   c) do-while
   d) enhanced for

7. **In Java, type casting between primitive types is done using:** **(c)**
   a) Implicit conversion only
   b) Explicit casting only
   c) Both implicit and explicit
   d) Not possible

8. **What is the structure of a basic Java program?** **(d)**
   a) Class > Method > Object
   b) Object > Class > Method
   c) Class > Object > Method
   d) Class > Main Method > Statements

9. **Which of the following defines a class correctly in Java?** **(b)**
   a) class Example()
   b) public class Example {}
   c) class = Example {};
   d) new class Example {}

10. **Which of these is not a primitive data type in Java?** **(d)**
   a) int
   b) double
   c) float
   d) String

11. **Which of the following is NOT part of the Java platform?** **(d)**
   a) JVM
   b) JDK
   c) JRE
   d) GCC

12. **Java is considered platform independent because:** **(c)**
   a) It uses pointers
   b) It is open-source
   c) Bytecode can run on any machine with JVM
   d) Java syntax is easy

13. **Which command is used to compile a Java program?** **(a)**
   a) javac
   b) java
   c) jvm
   d) jdk

14. **What is the extension of a compiled Java file?** **(a)**
   a) .class
   b) .exe
   c) .java
   d) .obj

15. **What is the default value of an int variable in Java?** **(a)**
   a) 0
   b) null
   c) undefined
   d) false

16. Every Java application must contain: **(a)**

a) main method
b) class constructor
c) package declaration
d) interface

17. Which keyword is used to define a class? **(c)**

a) object
b) public
c) class
d) static

18. Converting a larger data type into a smaller one is called: **(b)**

a) Widening
b) Narrowing
c) Boxing
d) Parsing

19. Which of the following is a correct way of casting? **(a)**

a) int x = (int) 4.5;
b) float y = (float) "123";
c) int z = "100";
d) None

20. What is the output of:

```
int x = 10;

if (x > 5)

    System.out.print("Yes");

else

    System.out.print("No");
```

(a)

a) Yes
b) No
c) Error
d) Nothing

II. Fill in the Blanks

1. Java programs are first compiled into **bytecode**, which is then interpreted by the **JVM**.
2. The entry point of any Java application is the **main** method.
3. In Java, the keyword used to declare a class is **class**.
4. A variable that can store only one of two values, true or false, is of **boolean** type.
5. The process of converting one data type into another is called **type casting**.
6. The **if-else** statement is used to perform conditional operations in Java.
7. **for**, **while**, and **do-while** are types of loops available in Java.
8. **System.out.println()** is used to print output in Java.
9. An object in Java is an instance of a **class**.
10. **new** keyword is used to create objects in Java.
11. The **if-else-if** statement is used to check multiple conditions.
12. The **switch** statement is used to select one value from multiple cases.
13. Implicit type conversion in Java is also called **Widening**.
14. Java has **8** primitive data types.
15. The data type used to store decimal values is **float or double**.
16. To run a Java program, we use the **java** command.
17. **Break** statement is used to exit from the loop.
18. Java is an **Object oriented** language (with respect to object).
19. Java was developed by **James Gosling** at Sun Microsystems.
20. Java does not support **Pointers,** which makes it more secure than C/C++.

III Short Answers

1. **What is JVM in Java?**
   Ans: JVM (Java Virtual Machine) interprets compiled Java bytecode and allows Java applications to run on any platform.
   It provides platform independence and manages memory via garbage collection.
2. **What are the main features of Java?**
   Ans: Java is platform-independent, object-oriented, robust, secure, and supports multithreading.
   It uses a "Write Once, Run Anywhere" approach through the JVM.
3. **Explain the structure of a Java program.**
   Ans: A Java program typically includes a class, a main() method, and statements inside it.
   The program starts execution from the main() method.
4. **What is type casting in Java?**
   Ans: Type casting converts a variable from one data type to another.
   It can be implicit (widening) or explicit (narrowing).
5. **Differentiate between 'if' and 'switch' statements.**
   Ans: if can evaluate any condition and supports ranges, while switch works with discrete values.
   switch is faster for multiple equality comparisons.
6. **What is an object in Java?**
   Ans: An object is an instance of a class that encapsulates data and behavior.
   It is created using the new keyword.

7. **What is Garbage Collector?**

   Ans: The Java platform allows you to create as many objects as you want, and you don't have to worry about destroying them. The Java runtime environment deletes objects when it determines that they are no longer being used. This process is called Garbage collection.

8. What is nested if statement?

Ans: A nested if statement is an if statement which is defined inside another if statement.

9. What is a native code?

Ans: A native code is a code that after you compile it, the compiled code runs on a specific hardware.

10. What is collection API?

Ans: The collection API is a set of classes and interfaces that support operation on collection of objects.

UNIT II

II. Multiple Choice Questions (MCQs)

1. **Which keyword is used to define a method in Java?** **(d)**
   a) function
   b) def
   c) method
   d) void

2. **What is method overloading?** **(b)**
   a) Using same method name with different return types
   b) Using same method name with different parameters
   c) Calling a method inside another method
   d) Redefining inherited method

3. **What is the purpose of a constructor?** **(a)**
   a) To initialize objects
   b) To destroy objects
   c) To execute automatically during class loading
   d) None of the above

4. **Which keyword is used to refer to the current object in Java?** **(b)**
   a) current
   b) this
   c) super
   d) self

5. **What is constructor overloading?** **(b)**

   a) Having multiple classes with same name

   b) Declaring many constructors with different parameters

   c) Using different return types

   d) Overriding constructors in subclass

6. Static methods and variables belong to: **(c)**

a) Object

b) Constructor

c) Class

d) Package

7. Which is the correct way to declare a one-dimensional array in Java? **(a)**

a) int arr[] = new int[5];

b) int arr[5];

c) array int[5];

d) new int arr[5];

8. Which of these is a valid declaration for a two-dimensional array? **(a)**

a) int[][] arr = new int[2][3];

b) int arr = new int[2][3];

c) int arr[2][3];

d) array arr[2][3];

9. Which keyword is used to define a static method? **(d)**

a) shared

b) fixed

c) constant

d) static

10. What is the purpose of command-line arguments? **(c)**

a) To interact with user input

b) To pass data to methods

c) To pass information to the main method during program execution

d) To debug the program

11. What is an inner class in Java? **(c)**

a) A class defined outside all other classes

b) A class defined inside a method

c) A class defined within another class

d) A subclass

12. What type of inner class is defined within a method? **(c)**

a) Static inner class

b) Anonymous inner class

c) Local inner class

d) Abstract inner class

13. Which keyword is used to inherit a class in Java? **(c)**

a) implements

b) include

c) extends

d) inherit

14. Which type of inheritance is supported directly by Java? **(b)**

a) Multiple

b) Single

c) Hybrid

d) Virtual

15. What is method overriding? **(b)**

a) Defining a method with the same name in the same class

b) Defining a method with the same name and parameters in subclass

c) Calling a method from parent class

d) Using static methods

16. Which keyword is used to prevent method overriding? **(b)**

a) static

b) final

c) private

d) super

17. An interface in Java can contain: **(c)**

a) Only method implementations

b) Variables and method implementations

c) Only abstract methods (Java 7)

d) Constructors

18. Which keyword is used to create a package in Java? **(b)**

a) import

b) package

c) module

d) class

19. Which class is immutable in Java? **(c)**

a) StringBuffer

b) StringBuilder

c) String

d) ArrayList

20. Which of the following allows modification of string content? **(b)**

a) String

b) StringBuffer

c) final String

d) static String

II Fill in the Blanks:

1. A **package** is a namespace that organizes classes and interfaces.
2. The **import** keyword is used to access classes from other packages.
3. The **String** class is **immutable**, meaning its contents cannot be changed.
4. The **StringBuffer** class is used to create mutable strings.
5. Wrapper classes like **Integer, Double, Boolean** convert primitives into objects.
6. The **extends** keyword is used to create a subclass.
7. The **super** keyword is used to call a parent class constructor or method.
8. **Method Overriding** allows a subclass to provide a specific implementation of a method.
9. **final** keyword prevents method overriding.
10. Interfaces contain only **abstract methods** (before Java 8) and no constructors.
11. An inner class is defined **within** another class.
12. Inner classes can access the **members** of the outer class, including private ones.
13. The **static** keyword in Java defines class-level variables and methods.
14. A **one-dimensional array** stores a linear collection of elements of the same type.
15. A **two-dimensional array** can be visualized as a matrix or table.
16. Command-line arguments are passed to the **main method** using the **String[] args** parameter.
17. **Static methods** cannot access non-static members directly.
18. Methods that have the same name but different parameters are said to be **overloaded**.

19. A **constructor** is automatically invoked when an object is created.
20. The **this** keyword refers to the current instance of the class.

III Short Answers

1. What is method overloading in Java?
Ans: Method overloading allows multiple methods with the same name but different parameters.
It improves readability and reusability.

2. What is constructor overloading?
Ans: Constructor overloading means having multiple constructors in a class with different parameter lists.
It allows creating objects in multiple ways.

3. Explain the use of this keyword.
Ans: this refers to the current object inside a class.
It is used to resolve conflicts between class attributes and parameters.

4. What is the use of the static keyword?
Ans: static means the member belongs to the class, not instances.
It can be accessed without creating an object.

5. What is inheritance in Java?
Ans: Inheritance allows a class to acquire properties and methods of another class.
It supports code reusability and method overriding.

6. How does Java achieve multiple inheritance?
Ans: Java achieves multiple inheritance using interfaces.
A class can implement multiple interfaces but extend only one class.

7. What is the difference between abstract class and interface?
Abstract class can have both abstract and concrete methods.
Interface contains only abstract methods and no implementation.

8. What are wrapper classes?
Wrapper classes convert primitive data types to objects.
Examples include Integer, Float, Double, etc.

9. What is a package in Java?
A package is a collection of related classes and interfaces.
It helps in organizing classes and avoiding name conflicts.

10. What is the benefit of using packages?

Packages help organize code, avoid name clashes, and provide access protection.

UNIT III

1. **What is an exception in Java?** **(c)**
   a) A syntax error
   b) A compilation error
   c) A run-time error
   d) A logical error
2. **Which keyword is used to handle exceptions in Java?** **(d)**
   a) error
   b) catch
   c) try
   d) Both b and c
3. **Which block is always executed whether an exception is handled or not?** **(d)**
   a) try
   b) catch
   c) throw
   d) finally
4. **Which of the following is a type of exception in Java?** **(d)**
   a) Compile-time exception
   b) Run-time exception
   c) Checked and Unchecked exceptions
   d) All of the above
5. **Which keyword is used to create a user-defined exception?** **(c)**
   a) new
   b) class
   c) extends Exception
   d) throw Exception
6. **Which class is used to create a thread by extending it?** **(b)**
   a) Runnable
   b) Thread
   c) Process
   d) Task
7. **Which method is called to start a thread in Java?** **(c)**
   a) init()
   b) run()
   c) start()
   d) execute()
8. **Which interface is implemented for multithreading?** **(b)**
   a) Serializable
   b) Runnable
   c) Cloneable
   d) AutoCloseable
9. **Which method defines the actual behavior of a thread?** **(c)**
   a) start()
   b) stop()

c) run()
d) sleep()

10. **Which keyword is used for synchronization in Java?** **(c)**
    a) thread
    b) sync
    c) synchronized
    d) join
11. **Which package contains Java's input and output classes?** **(b)**
    a) java.net
    b) java.io
    c) java.lang
    d) java.util
12. **Which class is used to read from a file using byte stream?** **(c)**
    a) FileReader
    b) BufferedReader
    c) FileInputStream
    d) Scanner
13. **Which class is used for writing byte data to a file?** **(b)**
    a) FileWriter
    b) FileOutputStream
    c) BufferedWriter
    d) DataOutput
14. **Which class allows random access to a file?** **(c)**
    a) File
    b) RandomFile
    c) RandomAccessFile
    d) SeekFile
15. **Which class is used to read input using tokens or regular expressions?** **(c)**
    a) Buffer
    b) FileInputStream
    c) Scanner
    d) DataInputStream
16. **Which package is automatically imported in all Java programs?** **(c)**
    a) java.io
    b) java.util
    c) java.lang
    d) java.awt
17. **Which class wraps a primitive data type into an object?** **(d)**
    a) DataWrapper
    b) PrimitiveBox
    c) WrapperClass
    d) Wrapper
18. **Which of the following is a checked exception in Java?** **(b)**
    a) NullPointerException
    b) IOException

c) ArrayIndexOutOfBoundsException
d) ArithmeticException

19. Which of the following exceptions is thrown when dividing by zero in Java? (b)
a) IOException
b) ArithmeticException
c) IllegalArgumentException
d) NumberFormatException

20. Which method in Java is used to pause the execution of the current thread for a specified time? (a)
a) sleep()
b) wait()
c) pause()
d) yield()

II Fill in the Blanks:

1. The **java.io** package provides classes for input and output operations.
2. **FileInputStream** is used to read data from files in the form of bytes.
3. **FileOutputStream** is used to write byte data to a file.
4. **Scanner** class is part of the java.util package and reads input from various sources.
5. The **RandomAccessFile** class allows non-sequential access to a file.
6. A **thread** is a lightweight sub-process.
7. The **start()** method begins the execution of a thread.
8. A class can create threads by extending **Thread** or implementing **Runnable**.
9. **run()** method contains the code that is executed by the thread.
10. The **synchronized** keyword is used to prevent thread interference and memory consistency errors.
11. An **exception** is an event that disrupts the normal flow of a program.
12. **try** and **catch** blocks are used for handling exceptions.
13. **finally** block is always executed after try and catch blocks.
14. **throw** keyword is used to explicitly throw an exception.
15. A **user-defined exception** is created by extending the **Exception** class.
16. If no constructor is defined, the compiler provides a **default constructor**.
17. Java performs automatic memory management using a process called **garbage collection.**
18. The base class for all character-oriented output streams is **Writer**.
19. The **close()** method is used to release system resources associated with a stream.
20. **BufferedReader** class is used to **read text efficiently** using buffering.

III Short Answers

1. What is an exception in Java?
Ans: An exception is an event that disrupts program execution.
Java handles it using try-catch blocks to prevent crashes.

2. Explain try-catch block.
Ans: Code that might cause an exception is placed inside try.
catch handles the exception gracefully.

3. What is multithreading?
Ans: Multithreading is executing multiple threads simultaneously.
It helps in efficient CPU utilization and faster execution.

4. How to create a thread in Java?
Ans: Threads can be created by extending the Thread class or implementing the Runnable interface.
The start() method is used to begin thread execution.

5. What is synchronization in threads?
Synchronization prevents two threads from accessing the same resource at the same time.
It avoids inconsistency and ensures thread safety.

6. What is the Scanner class used for?
Scanner is used to read input from various sources like keyboard and files.
It's part of java.util package.

7. What is the purpose of BufferedInputStream?
Ans: BufferedInputStream provides efficient reading of data from input streams.
It uses an internal buffer to reduce I/O operations.

8. Name two ways to create a thread in Java.

Ans: By extending the `Thread` class or implementing the `Runnable` interface.

9. What is synchronization in Java?
A mechanism to control access to shared resources by multiple threads to prevent data inconsistency.

10. What is a try-with-resources statement?
A try statement that automatically closes resources after execution.

UNIT IV

1. **Which package contains the Applet class?** **(b)**
   a) java.awt
   b) java.applet
   c) java.io
   d) javax.swing

2. **What is the correct order of the Applet life cycle?** **(b)**
   a) start(), init(), paint(), destroy(), stop()
   b) init(), start(), paint(), stop(), destroy()
   c) init(), paint(), start(), stop(), destroy()
   d) init(), paint(), destroy(), stop(), start()

3. **Which method is used to draw text on an Applet?** **(d)**
   a) println()
   b) draw()
   c) displayText()
   d) drawString()

4. **Which class provides methods like drawLine() and drawString()?** **(b)**
   a) Applet
   b) Graphics
   c) Painter
   d) AWT

5. **Which method is called only once during the lifecycle of an Applet?** **(c)**
   a) start()
   b) paint()
   c) init()
   d) destroy()

6. **Which package is required for event handling in Java?** **(b)**
   a) java.util
   b) java.awt.event
   c) java.io
   d) java.awt.graphics

7. **Which interface is used for handling button click events?** **(b)**
   a) WindowListener
   b) ActionListener
   c) ItemListener
   d) KeyListener

8. **Which method is defined in the ActionListener interface?** **(a)**
   a) actionPerformed()
   b) keyPressed()
   c) itemChanged()
   d) buttonClicked()

9. **Which of the following is NOT an event class in Java?** **(c)**
   a) ActionEvent
   b) MouseEvent
   c) KeyboardEvent
   d) WindowEvent
10. **How are event listeners registered in AWT?** **(c)**
   a) using addEvent()
   b) using setListener()
   c) using addXListener() methods
   d) using handleEvent()
11. **Which package contains AWT classes?** **(a)**
   a) java.awt
   b) java.swing
   c) java.applet
   d) java.io
12. **Which of the following is a container in AWT?** **(c)**
   a) Label
   b) Checkbox
   c) Frame
   d) TextField
13. **Which AWT component is used for selecting one of many options?** **(d)**
   a) Checkbox
   b) TextField
   c) RadioButton
   d) Choice
14. **Which layout arranges components in a single row or column?** **(a)**
   a) GridLayout
   b) BorderLayout
   c) FlowLayout
   d) BoxLayout
15. **Which of these is not an AWT component?** **(c)**
   a) TextArea
   b) Button
   c) JFrame
   d) Label
16. **Which package contains Swing components?** **(c)**
   a) java.awt.swing
   b) java.swing
   c) javax.swing
   d) swing.javax
17. **Which component is the top-level container in Swing?** **(c)**
   a) JWindow
   b) JPanel
   c) JFrame
   d) Container

18. **Which class is used for creating panels in Swing?** **(a)**
    a) JPanel
    b) JContainer
    c) JBox
    d) JForm
19. **What is a major advantage of Swing over AWT?** **(d)**
    a) More CPU usage
    b) Uses native code
    c) Platform dependence
    d) Lightweight components
20. **Which Swing component is used to display a table of data?** **(a)**
    a) JTable
    b) JList
    c) JComboBox
    d) JTextArea

II Fill in the Blanks:

1. Swing components are part of the **javax.swing** package.
2. **JFrame** is the base container used in Swing applications.
3. **JPanel** is a generic container used for organizing components.
4. **JTable** is used to display tabular data in Swing.
5. Swing is built on top of **AWT**, but is more flexible and ***lightweight***.
6. AWT stands for **Abstract Window Toolkit**.
7. A **Frame** is a top-level container in AWT.
8. **Label**, **Button**, and **Checkbox** are examples of AWT components.
9. **FlowLayout** is the default layout for Panel in AWT.
10. A **Container** holds and organizes components.
11. **Event handling** is used to manage user interactions like clicks, key presses, etc.
12. **ActionListener** interface is used to handle button events.
13. The **actionPerformed()** method is called when an event is triggered.
14. Event classes are available in the **java.awt.event** package.
15. Listeners are registered using methods like **addActionListener()**.
16. Applets are Java programs that run inside a **browser** *or* **applet viewer**.
17. The **init()** method is called when the Applet is first loaded.
18. **paint(Graphics g)** method is used to display output on the screen.
19. The class **Graphics** is used for drawing shapes, text, and images.
20. The **Applet** class is part of the **java.applet** package.

III Short Answers

1. What is an Applet in Java?
Ans: Applet is a small Java program that runs in a web browser.
It is used for creating dynamic web content.

2. What are the lifecycle methods of an Applet?
Ans: The lifecycle includes init(), start(), paint(), stop(), and destroy().
These control applet behavior from load to unload.

3. What is event handling in Java?
Ans: Event handling is the mechanism that controls user interactions like clicks.
Java uses event listeners to handle events.

4. Differentiate between AWT and Swing.
AWT is platform-dependent and heavyweight.
Swing is lightweight and provides a richer set of components.

5. What is a layout manager?
Ans: A layout manager arranges GUI components inside a container.
Examples include FlowLayout, BorderLayout, GridLayout.

6. What is the purpose of JTable in Swing?
Ans: JTable is used to display data in a tabular format.
It allows customization of rows, columns, and data models.

7. What is command-line argument in Java?

Ans: Command-line arguments are values passed to the main() method when a Java program is executed.
They are stored in the String[] args array and accessed using index values.

8. What is an inner class in Java?

Ans: An inner class is a class declared within another class.
It helps in logically grouping classes and accessing outer class members easily.

9. **What is the difference between `JFrame` and `JDialog`?**
Ans: JFrame is a top-level window with a title bar, while JDialog is a pop-up dialog window.

10. What is the role of `Toolkit` class in AWT?
It is used to get system resources like screen size and create GUI elements.