

**Department of Computer Science.
Islamiah College (Autonomous).**

Question Bank Programming in Java

**for
II B.Sc./B.C.A./ B.Sc., (SW)
Second Year – Fourth Semester**

(332 Questions)

Unit	Part-A	Part-B	Part-C	
I	20	15	10	
II	23	25	10	
III	35	31	20	
IV	21	46	21	
V	20	20	15	
Total Questions	119	137	76	Grand Total 332

Unit I Part A (2 Marks)

1. What are the three concepts involved in OOP?
2. Java is a “*platform-independent language*.” What does this mean?
3. List bit-wise operators in java.
4. Name the different types of constants defined in java.
5. Write the expression in java. $x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$
6. What is associativity in operators' precedence?
7. Write a program in Java to print the following pattern using *for* statement(s).
1
2 3
4 5 6
7 8 9 10
8. What are access modifiers?
9. What are the data types supported in Java?
10. How is a constant defined in Java?
11. What is a String in Java? Name a few String methods.
12. How do you write an infinite loop using the (i) *for* statement (ii) *while* statement?
13. Consider the following code snippet.

```
if (aNumber >= 0)
if (aNumber == 0)
System.out.println("first string");
else System.out.println("second string");
System.out.println("third string");
```

What output do you think the code will produce if aNumber is 3? Use braces { and }, to further clarify the code.
14. Write the general form of a *switch* statement. Give an example.
15. Write a program to convert the given fahrenheit temperature to corresponding centigrade temperature.
16. If int x = 100, what is the value of each of the following expressions?
 $x == 99 + 1$? $5 : 7$, $\sim(-x)$, $x >>> 2$, $x \wedge x$, $x \% 30$
17. What is printed by the following code fragment?

```
int n = 2004;
inti = 0;
for (i = 0; n > 0; i++, n /= 10);
System.out.println(i);
```
18. What are the uses of break and continue statements in a loop?
19. What is meant by Method Overloading?
20. Write a recursive method to find factorial of a given number.

Unit I Part B (5 Marks)

1. Write a java program that reads the radius of a sphere and computes its volume.
2. Write a java program that reads the radius of a circle and computes the circumference and area.
3. Write a program in java to read a digit and display in word. (Ex. Input 4, Output: Four)
4. Why main() in java is declared as *public static void main*? What if the *main* method is declared as private?
5. Write a Java program to reverse String in Java without using functions.
6. What is a *break* and *continue* statement? Explain with examples.
7. Given a positive whole number, write a java program to test whether it is an Armstrong number.
8. A bank collects an interest of 6% on loans given upto Rs. 5000, 8% for loans between Rs. 5001 and 10000, 10% for loans above Rs. 10000. Write a program to find the one year interest for a given amount.
9. What is recursive method?
10. Write a program in java to find the largest element in an array with n elements.
11. Write a program in java to check whether the given number is a palindrome.
12. Write a program to find the factorial of a number using recursion.
13. Define a method *sumOfDigits()*, for finding the sum of digits in a given number.
14. Give the general form of a method. Write any two advantages of using methods in a program.
15. Write instructions in java to read a two dimensional array of size r,c and print it.

Unit I Part C (10 Marks)

1. Explain at least ten mathematical built in functions in java with example.
2. Write a function *isPrime()* that returns true if the number is prime. Use it to print Prime Numbers up to 100.
3. Write a program using a *do ..while* loop to calculate and print the first 20 Fibonacci numbers
4. Write a function to calculate factorial and use it to find the sum of the series $1!/1+2!/2+3!/3+4!/4+5!/5$.
5. Name five important control statements in java with example for each.
6. Write a program in java to arrange the values in an array in ascending order.
7. Write a program to initialize a two dimensional array and display only the upper diagonal elements.
8. Write a program in java to print the transpose of a given matrix.
9. Write a Java code to count number of vowels, words in a given sentence.
10. Write a Java program to find area of Square, Rectangle and Circle using method overloading.

Unit II Part A (2 Marks)

1. Define class and object with an example.
2. Explain the difference between instance variable and a class variable.
3. What is the difference between a constructor and a method?
4. What is an overloaded method?
5. What is a copy constructor?
6. What is the use of *this* keyword?
7. What is the use of *finalize()* method?
8. What is an *abstract* class?
9. Explain the purpose of import statement.
10. Which classes can an applet extend?
11. What is the order of method invocation in an Applet?
12. What tags are mandatory when creating HTML to display an applet?
13. What is final class and final method?
14. Show the use of *super* keyword with an example.
15. What is an Applet? How it differs from an application?
16. What will happen if we call *super()* in constructor but our class does not extend any class?
17. For what do you use the *start()* and *paint()* methods?
18. Define the base class and the derived class.
19. How an interface defined? Give an example.
20. What is the main difference between *abstract* method and *final* method?
21. Differentiate between Class and Interface.
22. Mention True/False
 - A char is the same as a String of length 1.
 - An interface must declare one or more methods.
 - The declaration `String[] s;` does not allocate any space.
 - An abstract class may contain both abstract and concrete methods.
23. How a class can't be extended and how a method can't be overridden?

Unit II Part B (5 Marks)

1. Explain static data members and static member functions with example.
2. Differentiate between instantiated and Static class members.
3. Define a class Square with Data Member: side and methods to compute : `squareArea()`, `squarePerimeter()` and `squareDiagonal()`.
4. Define a class Circle with data members : radius, angle and methods to compute: `circumference()`, `arcLength()` and `area()`.
5. Give the difference between a class and an anonymous Inner class.
6. What is an inner class and what are its types?
7. What is inheritance? What are its types?
8. How inheritance is implemented in Java? What is its use?
9. What is multiple and multilevel inheritance? How do you implement multiple inheritance in java?
10. What is method overriding? How can we access an overridden method?
11. How to pass arguments to the constructor of a base class?
12. What is meant by *run-time polymorphism*? What is its use?

13. Differentiate between *overriding* and *overloading* a method.
14. What is *final* class, *final* method and *final* variable?
15. What differences are between *extends* and *implements*?
16. Define an interface named *shape2d* that contains the declaration of the method *getArea()*.
17. What is meant by multiple implementation of an interface?
18. What is a package? Given an example and its advantages.
19. What are access control modifiers? Explain.
20. What are the restrictions imposed on Java applets?
21. How to pass parameters to an applet from HTML page to an applet?
22. What are the steps involved in Applet development?
23. Write an applet to draw a hexagon in orange color
24. Write an applet to display a rectangle in centered form.
25. Give the list of classes and interfaces in java.util packages.

Unit II Part C (10Marks)

1. Define a class triangle with data members: side1,side2,side3,angle1,angle2,angle3. Write methods to compute Perimeter(),Area(),isocles(),equilateral(),rightAngled().Test this class by creating an object.
2. Define a class named Square. Datamember: a and Methods: Constructor, area(). Define another class Rectangle that extends from Square with Data member: b and Methods: Constructor, area().Define one more class Triangle that extends the class Rectangle with Data member : c and Methods: Constructor, area().Create objects for the classes Square, Rectangle and Triangle.
3. Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides(). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides() that shows the number of sides in the given geometrical figures.
4. Define class named Rectangle, such that it implements the interface shape2d and has the following description: Data member: Length, Breadth and Methods: (a) Constructor (b) getArea(). Create an object for the class Rectangle and invoke the getArea().
5. What are the attributes of Applet tag and explain.
6. List and explain the methods of Graphics class for drawing various shapes.
7. Write an applet to draw a Square in green color and a maximum possible circle in side square in blue color.
8. Write an applet to draw two pie diagrams to represent the income and expenditure of a company over a year.
9. Write an applet to draw a vertical bar chart to represent the growth of sales over past five years.
10. Explain the life cycle of an Applet.

Unit III Part A (2 Marks)

1. What is AWT?What is a container?
2. What is an event and an event handler?
3. What is a listener and mention a few listener Interfaces.
4. What class is the top of the AWT event hierarchy?
5. Name three subclasses of the Component class.
6. How BorderLayout places the components?
7. What is the style of GridLayout?
8. When CardLayout can be used?
9. What is a Panel?
10. What is the difference between choice and list?
11. What is the difference between a ScrollBar and a ScrollPane?
12. How are the elements of different layouts organized?
13. How are the elements of a GridBagLayout organized?
14. What is the difference between a Window and a Frame?
15. What is the difference between frame and panel in Java AWT?
16. What is Modal and Modeless dialog?
17. What are differences between Swing and AWT?
18. When to use JOptionPane in Swing?
19. How do you sort JTable based upon Colum?
20. What is the difference between an exception and error?
21. What is a stacktrace and how does it relate to an exception?
22. What are some advantages of exceptions?
23. What is OutOfMemoryError in Java?
24. What is unreachable catch block error?
25. Give some examples to checked and unchecked exceptions?
26. What is an exception and what are its two types?
27. Differentiate throw and throws.
28. What are the benefits of user defined exception handling?
29. What are the benefits of multi threading?
30. What is difference between Process and Thread in java?
31. What are thread priorities?
32. What is daemon thread?
33. What is a join() method?
34. Write code to change the background color whenever mouse button is held down.
35. Which methods are useful in inter process communication?

Unit III Part B (5 Marks)

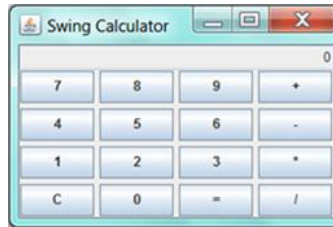
1. Explain the procedure to design menu in java.
2. List the various constructors and methods in Dialog class.
3. List the various mouse events and listeners and explain.
4. Which event handlers are available for WindowEvent?
5. Bring out the importance of adapter classes.
6. Briefly explain the use of inner classes in AWT.

7. Briefly explain the benefits of using anonymous inner classes in AWT.
8. Write an applet to draw line on mouse move event.
9. Write code to change the JLabel text with the JTextField text on JButton click event.
10. Show simple implementation of JComboBox with its associated methods.
11. Explain JTabbedPane and JTable controls with simple example.
12. How can you handle an exception?
13. How can you catch multiple exceptions?
14. What are the rules we need to follow when overriding a method that throws an exception?
15. What are the Exception Handling Keywords in Java?
16. Explain Java Exception Hierarchy?
17. List a few Java Exception Classes and its methods.
18. What is difference between throw, throws and throwable keywords in Java?
19. How to write custom exception in Java?
20. What is Thread in java? How to implement Threads in java?
21. Draw a picture of thread life cycle.
22. What is the difference between yield and sleeping in thread?
23. Differentiate sleep() and wait() methods of a Thread class.
24. What are differences between implementing Runnable and extending Thread?
25. Why implementing Runnable interface is better in multi-threading?
26. What is difference between starting thread with run() and start() method?
27. Differentiate between notify() and notifyAll() methods.
28. Discuss the user defined exception handling mechanism with syntax and example
29. Write a program to illustrate catch block searching pattern
30. What is deadlock? What harmful effect does it have?
31. Define a thread to generate the factorial of first 20 numbers.

Unit III Part C (10 Marks)

1. What are the different types of controls in AWT? Draw the hierarchy of control classes.
2. What is the relationship between an event-listener interface and an event-adaptor class?
3. What is a layout manager and what are different layout managers available?
4. Write a GUI with a text field and a button. The text field should display the number of times the button is clicked.
5. Develop an applet that receives two integers and displays quotient and remainder.
6. Create two choice controls, one with few font-names and other with few color names and display the selections.
7. Write code to change the background color on changing three Sliders for Red, Green and Blue.
8. Write code to add a horizontal scroll bar at bottom and vertical scroll bar at right using border layout and display the scroll positions.
9. Create four panels with some controls of different types in each panel.
10. A menu bar contains three menus. Each menu has three menu items. Write an applet to display the selected option.
11. Develop an applet that creates a frame with a button. On button click, display a modal dialog of 50x50 size with random color.

12. Using suitable layout, design a simple calculator with suitable controls and event handlers.



13. Develop an application using swing components to read a number and compute factorial.

14. Read 10 marks in an array. Define your own exception WrongMarkException. Catch this when a mark is less than 0 or greater than 100.

15. What is life cycle of Thread, explain thread states?

16. Write code to solve Producer Consumer problem in Java?

17. What is meant by synchronization in thread? Why it is needed?

18. Create a thread with maximum priority to display odd numbers and another thread with minimum priority to display even numbers.

19. Write a program to execute three threads. First thread display "Good Morning" every one second, second thread "Hello" every two second and third thread displays "Welcome" every three seconds.

20. Write a thread that that prints dots at random location on the screen.

Unit IV Part A (2 Marks)

1. What is a IO stream? What are its two types?
2. What are FileInputStream and FileOutputStream?
3. Name the filter streams available?
4. Name the filter stream classes on reading side of byte stream?
5. What is the functionality of SequenceInputStream?
6. What is PrintStream and PrintWriter?
7. Which streams are advised to use to have maximum performance in file copying?
8. What interface must an object implement before it can be written to a stream as an object?
9. What is StreamTokenizer class? What is its use?
10. What interface must an object implement before it can be written to a stream as an object?
11. When to use writeUTF() and readUTF() methods.
12. What is a socket? What does it do?
13. What are the two important TCP Socket classes?
14. Which class is used by server applications to obtain a port and listen for client requests?
15. What is the difference between URL instance and URL connection instance?
16. How to convert String to byte array and vice versa?
17. How do you check if two Strings are equal in Java?
18. List a few String Class methods and its purpose.
19. What are different ways to create String Object?
20. List any three unique features of Vector class.
21. What is the significance of accept() method of the ServerSocket class?

Unit IV Part B (5 Marks)

1. List the methods of InputStream and OutputStream Classes.
2. How to read file content using byte array in java?
3. Explain the subclasses of Reader and Writer Classes.
4. What is File class? What is RandomAccessFile?
5. How to use ObjectOutputStream/ObjectInputStream?
6. What are the FileReader and BufferedReader?
7. What are the FileWriter, BufferedWriter and PrintWriter?
8. What is the difference between Reader Writer and input output streams?
9. What is object Serialization and what is its use?
10. How to write text to a file?
11. How many ways can we read data from the keyboard?
12. Write program to copy characters from one file to another in java?
13. Write program to count number of characters in a file in java.
14. Explain how seek() method is used in random access files.
15. Define the terms (i) Host (ii) protocol (ii) port-number (iv) Node
16. Difference between TCP and UDP protocol?
17. What are the seven layers of OSI model?
18. What are Datagram's and Sockets?
19. How do you represent and connect an URL resource in Java?
20. What are sockets? How it is represented in Java?

21. What is a ServerSocket and how is it used?
22. Write Java code to establish a connection between a Server and a client.
23. Write Java code to send a message from server to the client.
24. Write a program to send a number from the server to the client.
25. Give the difference between String, StringBuffer and StringBuilder?
26. What is mutable? Why String is immutable in Java?
27. Write a java program to reverse each word of a given string?
28. Write the Number class hierarchy and explain the methods of each sub classes.
29. Why we use primitive data types instead of class data types?
30. Explain the methods of (i) Character Class (ii) Boolean Class with example.
31. Explain the methods of Math Class with example.
32. Explain three different ways of creating a StringBuffer object.
33. Briefly explain the append() and insert() methods of the StringBuffer Class.
34. What is Collection? What is a Collections Framework? What are the benefits of it?
35. What is the difference between collection and Collections?
36. What is the difference between List and Set?
37. What is the difference between Map and Set?
38. How to reverse the List in Collections?
39. How to convert the array of strings into the list?
40. Write about ArrayList class.
41. What is the difference between ArrayList and Vector?
42. What is the difference between HashMap and Hashtable?
43. What is the difference between Iterator and Enumeration?
44. What are the difference between Iterator and ListIterator?
45. StringBuffer class is mutable – justify.
46. Explain StringBuffer class.

Unit IV Part C (10 Marks)

1. Explain the subclasses of InputStream and OutputStream Classes.
2. What is meant by Stream and what are the types of Streams and classes of the Streams?
3. What is the difference between the Reader/Writer class hierarchy and theInputStream/OutputStream class hierarchy?
4. Give a detailed account of String class with illustrative examples.
5. Create a file with name,gender of ten employees and write a program to list only male employees.
6. Write a program to read a buffer of 100 bytes starting from 250th byte in a random file.
7. Write a program to read the contents of a file, one character at a time and find the number of occurrences of vowels.
8. Read a text file and find the frequency of occurrence of each letter.
9. Write a chat application using TCP.
10. Write a chat application using UDP.
11. Develop a UDP server which will receive text from client and send capitalized text to client as reply.
12. Write java code showing insertion,deletion and retrieval of HashMap object ?
13. Which two important methods are declared in the Enumeration Interface?
14. Differentiate between elementAt() and contains() methods.
15. Dictionary class cannot be instantiated - Comment on this statement.

16. List methods to add and retrieve data in a Properties object.
17. What are the salient features of StringTokenizer class?
18. Write program to convert five float type constants to Float type objects and place them in Vector. Make provision to display, insert and remove from vector.
19. Get six integers from command line arguments and place them in Stack ensuring that duplicate values are not stored in stack.
20. Place name, price of five items in hash table. Get the item name and retrieve its price from hash table.
21. Use PAN as a key and the person object as a value. A person object should store the person's name, phone number and email address. Get the PAN number of a person and display all his details.

Unit V Part A (2 Marks)

1. What is JDBC?
2. What is SQL, DML and DDL?
3. What are place holders? What is its purpose?
4. What is ResultSetMetaData?
5. What is MIME?
6. What is rmic?
7. What is meant by Session Tracking?
8. Define Cookies.
9. Define stub and skeleton.
10. What are Java beans?
11. What are the JDBC statements?
12. What are Metadata? How are they used?
13. What is ResultSet? What are its methods?
14. Define RMI.
15. What is the RMI Registry?
16. What useful purpose does rmiregistry serve?
17. What is the inter-servlet communication?
18. What are Remote callbacks?
19. What are JAR files used for?
20. What is property editor in java beans?

Unit V Part B (5 Marks)

1. What are the steps to connect to the database in java?
2. How do we establish a connection to a data table in MySql from a Java program?
3. What is the difference between Statement and PreparedStatement interface?
4. What is the difference between execute, executeQuery, executeUpdate?
5. How do we call stored procedure using JDBC?
6. Differentiate between two-tier and three-tier models.
7. Difference between GET and POST requests
8. Define Static and Dynamic Website.
9. Create a simple Servlet.
10. What is difference between GenericServlet and HttpServlet?
11. Explain Servlet API life cycle methods.
12. Explain Servlet Class hierarchy.
13. Write an RMI to add two numbers.
14. Explain the steps for executing a RMI program.
15. List the advantages and disadvantages of RMI.
16. What functionalities does the UnicastRemoteObject provide?
17. What is difference between GenericServlet and HttpServlet?
18. What is the purpose of RequestDispatcher Interface?
19. What is the role of stub in RMI?
20. What are the different types of classes that are used in RMI?

Unit V Part C (10 Marks)

1. Write a program using JDBC to create a table and insert, update and delete records.
2. How do Java applications access the database using JDBC?
3. Create a JDBC application to create an employees table and increase salary by given amount to all employees of a given department using procedure call.
4. What is the function of a servlet? What does the request and response object do?
5. Create a dynamic web application project. Add a html file (index.html) and add two servlets one to addcookie and another getcookie.
6. Create a dynamic web project. Add an index.html file and two servlets ValidateServlet and WelcomeServlet.
7. What is a transaction? How does it help in ensuring data consistency?
8. Define Cookie Class. Write code and store and retrieve Cookies.
9. Create a RMI to add two numbers.
10. What are the steps involved to make work a RMI program?
11. Write a program to show the remote interface using RMI.
12. Create a simple bean.
13. Create a simple Message Bean.
14. Create a simple MathsBean.
15. Create a bean that displays filled rectangle or filled oval. It changes both the shapes and color during each invocation.