P.S.R. ENGINEERING COLLEGE, SIVAKASI – 626 140

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

QUESTION BANK

Programme:	B.E.	Branch	Electronics and Communication Engineering
Academic Year:	2024-2025	Year/Semester	II/IV
Course Code:	231EC45	Course Name	JAVA Programming
Course Tutor:	Dr.S.Thayammal , ASP/ECE Mr.D.Arun Shunmugam, AP/ECE		

UNIT 1 - JAVA FUNDAMENTALS

PART - A

S.No	Questions	Bloom's category Level	Course outcome
1.	Who invented Java Programming? a) Guido van Rossum b)James Gosling c)Dennis Ritchie d)Bjarne Stroustrup **Answer: b**	K1	CO1
2.	Which one of the following is not a Java feature? a) Object Oriented b) Use of Pointers c)Portable d) Dynamic & Extensible **Answer: b**	K1	CO1
3.	The while loop repeats a set of code while the condition is not met? a)True b) False **Answer: b**	K1	CO1

4.	What will be the output of the following Java code?
	class increment {
	public static void main(Stringargs[])
	{
	int g = 3;
	System.out.print(++g * 8);
	}
	}
	a)23 b) 32 c)33 d)24 **Answer: b**
		K1	CO1

5.	Which statement is true about Java? a)Java is a sequence-dependent programming language b) Java is a code dependent programming language c) Java is a platform-dependent programming language d) Java is a platform-independent programming language **Answer: c**	K1	CO1
6.	What is the extension of java code files? a) .js b) .txt c) .class d) .java **Answer: d**	K1	CO1
7.	Which of the following is a type of polymorphism in Java Programming? a) Multiple polymorphism b) Compile time polymorphism	K1	CO1

	c) Multilevel polymorphism d) Execution time polymorphism **Answer: b**		
8.	What will be the output of the following Java program? a) 1 2 3 4 5 b) 1 2 3 4 c) 1 2 d) 1 2 3 **Answer :d**	K1	CO1
9.	What is the purpose of control statements in Java? a) To perform mathematical calculations b) To create objects c) To declare variables d) To control the flow of execution in a program **Answer : d**	K1	CO1
10.	What is an Array in Java? a) A collection of elements with different types b) A collection of elements with the same type c) A resizable data structure d) A container for storing key-value pairs **Answer: b**	K1	CO1
11.	How do you access a element in an array in java/ a) By using the element's value b) By using the element's index c) By using the element's key d) By using the element's label **Answer: b**	K1	CO1
12.	Which of the following is used to perform bitwise XOR in java? a)% b) & c)^ d)" **Answer: c**	K1	CO1
13.	What is the result of the expression 2 + 2 * 2 / 2 – 2? a)2 b) 0 c)4 d)-2 **Answer: a**	K1	CO1
14.	Which component is used to compile, debug and execute java program? a) JVM b) JDK c) JIT d) JRE **Answer: d**	K1	CO1
15.	What is class in java? a)static reference b) template or blueprint c) instance of class d) None of above **Answer: b)**	K1	CO1
	PART-B (2 marks)		
1.	List the features of Java Programming	K1	CO1
2.	Define classes and Objects	K1	CO1
3.	Define Polymorphism.	K1	CO1
4.	Compare Object Oriented Programming and Procedure Oriented Programming.	K2	CO1
5.	What are the datatypes available in java ?	K1	CO1
6.	How will you declare and access the elements of an array?	K2	CO1
7.	What is meant by Static binding and Dynamic binding?	K1	CO1
8.	Write a simple java code to add two numbers.	K2	CO1
9.	Write a java code to check the number is positive or negative.	K2	CO1

10.	Show the code to check the given number is od or even.	K2	CO1
11.	Define variable and how will you declare ?	K2	CO1
	PART-C (14 marks)		
1.	Outline the working of Java Virtual Machine (JVM) Architecture.	K2	CO1
2.	Explain about different data types in java with examples for each.	K2	CO1
3.	Explain about the different types of Operators in java with examples.	K2	CO1
4.	Summarize the OOPS Concepts.	K2	CO1
5.	Demonstrate java program for the following: (i) to print Fibonacci series within given range. (ii)to print the Factorial of a given number using do while loop	K2	CO1
6.	Infer Java programs using Control structures with examples for each.	K2	CO1
7.	Demonstrate java program for the following: (i)to print prime numbers between the given range. (ii)to compare two numbers	K2	CO1

UNIT –II JAVA CLASSES

	PART - A		
1.	Which of these keywords are used to define an abstract class? a)Abstract b)abstract c)abst d)static **Answer: b)**	K1	CO2
2.	In JAVA, can a class implement multiple interfaces? a) Interfaces cannot be implemented by classes b) Only abstract classes can implement interfaces c) No, a class can implement only one interface **d)** Yes, a class can implement multiple interfaces **Answer: d)**	K1	CO2
3.	Which of these packages contains abstract keyword? a) java.lang b) java.util c) java.io d) java.system **Answer: a)**	K1	CO2
4.	Arrays in Java are implemented as? a) class b) object c) variable d) none of the mentioned **Answer: b)**	K1	CO2
5.	_____ keyword is used to prevent content of a variable from being modified? a) final b) last c) constant d) static **Answer: a)**	K1	CO2
6.	_____ cannot be declared static? a) class b) object	K1	CO2

	c) variable d) method **Answer: b**		
7.	Which of these access specifiers can be used for a class so that its members can be accessed by a different class in the different package? a) Public b) Protected c) Private d) No Modifier **Answer: a)**	K1	CO2

8.	What will be the output of the following Java program?
	
	package pkg;
	class output
	{
	public static void main(String args[])
	{
	StringBuffer s1 = new StringBuffer("Hello");
	s1.setCharAt(1, x);
	System.out.println(s1);
	}
	}
	
	a) xello
	b) xxxxx
	c) Hxllo
	d) Hexlo **Answer: c)**
		K1	CO2

9.	When does Exceptions in Java arises in code sequence? a) Run Time b) Compilation Time c) Can Occur Any Time d) None of the mentioned **Answer: a)**	K1	CO2
10.	Which of these keywords is used to manually throw an exception? a) try b) finally c) thrown d) catch **Answer: c)**	K1	CO2
11.	What is an exception in Java? a) An error that occurs during compilation b) An unexpected event that occurs during program execution c) A logical error in the code d) A warning issued by the compiler **Answer: b)**	K1	CO2
12.	Which class is the superclass of all exceptions in Java? a) Error b) Runtime Exception c) Throwable d) Exception **Answer: c)**	K1	CO2

13.	Which block must follow a try block? a) final b) catch c) done **Answer: b)** d) except	K1	CO2
14.	Which of the following is used to group multiple exceptions in a single catch block? a) Using the | operator b) Using the & operator c) Using the && operator d) Using the || operator **Answer: a)**	K1	CO2
15.	What is the use of try & catch? a) It allows us to manually handle the exception b) It allows to fix errors c) It prevents automatic terminating of the program in cases when an exception occurs d) All of the mentioned **Answer: d**	K1	CO2
16.	Which of these keywords are used for the block to be examined for exceptions? a) try b) catch c) throw **Answer: a)** d) check	K1	CO2

PART-B (2 marks)			
1.	What are different types of access modifiers (Access specifiers)?	K1	CO2
2.	Define Abstract class	K1	CO2
3.	Compare static and inner class.	K2	CO2
4.	Explain the usage of Java packages.	K2	CO2
5.	What is a package? How to define a package?	K1	CO2
6.	What is the difference between this () and super ()?	K2	CO2
7.	Define super class and subclass?	K1	CO2
8.	What is an Interface?	K1	CO2
9.	Define Wrapper class with example.	K1	CO2
10.	What is Exception Handling?	K2	CO2
11.	What is the use of try and catch block in java?	K2	CO2
12.	What are runtime exceptions?	K1	CO2
PART-C (14 marks)			
1.	Explain Abstract classes with an example program? Also describe the properties of abstract classes?	K2	CO2
2.	Build a Java Program to implement method Overloading and method overriding?	K3	CO2
3.	Explain about inner classes and its importance in Java.	K2	CO2
4.	Describe interfaces & how to implement it with a Java Program.	K2	CO2
5.	Explain exception handling mechanism in java?	K2	CO2
6.	How to handle multiple catch blocks for a nested try block? Explain with an example.	K3	CO2

7.	Summarize uses of 'throw' and 'throws' clauses for exception handling?	K2	CO2
8.	Develop a Library interface which has drawbook(), returnbook() (with fine), checkstatus() and reservebook() methods. All the methods tagged with public.	K3	CO2
9.	Develop a static Inner class called Pair which has MinMax method for finding min and max values from the array.	K3	CO2

UNIT- III I/O PACKAGE

PART – A			
1.	Which of these class is used to read characters in a file? a) FileReader b) FileWriter c) FileInputStream d) InputStreamReader **Answer:a)**	K1	CO2
2.	Which of these stream contains the classes which can work on character stream? a) InputStream b) OutputStream c) Character Stream **Answer:c)** d) All of the mentioned	K1	CO2
3.	What type of data can be read by an InputStream? a) Characters b) Raw bytes c) Strings d) Objects **Answer:b)**	K1	CO2
4.	_____is a process of extracting/removing the state of an object from a stream. a) Serialization b) Externalization c) File Filtering **Answer**:d) d) Deserialization	K1	CO2
5.	Which of these interface extends DataInput interface? a) Serializable b) Externalization c) ObjectOutput **Answer**:d) d) ObjectInput	K1	CO2
6.	State whether the following statements about the stream in Java. i) The two basic streams used are the input and output streams. ii) Filters are used to read data from one stream and write it to another stream. A) True, True B) True, False C) False, True **Answer**:a) D) False, False	K1	CO2
7.	_____ streams provide functionally for threads to communicate and exchange data between them. A) Object B) Piped C) Pushback **Answer:b)** D) Filtered	K1	CO2

8.	Multithreaded programming is a process in which _____ a) two different processes run simultaneously b) two or more parts of same process run simultaneously c) many different process are able to access same information d) single process can access information from many source **Answer:b)**	K1	CO2
9.	Thread priority in Java is _____ a) Integer b) Float c) double d) long **Answer:a)**	K1	CO2

10.	What is the name of the thread in the following Java Program?
	
	`class multithreaded_programing`
	`{`
	`public static void main(String args[])`
	`{`
	`Thread t = Thread.currentThread();`
	`System.out.println(t);`
	`}`
	`}`
	
	a) main
	b) Thread
	c) System **Answer: b)**
	d) None of the mentioned
		K1	CO2

11.	Which method is used to start a thread in Java? a) `run()` b) `start()` **Answer: b)** c) `execute()` d) `init()`	K1	CO2
12.	Which of the following is a disadvantage of multi-threading? a) Improved performance b) Reduced CPU utilization c) Complexity in debugging and testing d) Simpler code structure **Answer:c)**	K1	CO2
13.	What is the primary advantage of multi-threading in Java? a) Better resource management b) Simultaneous execution of tasks c) Enhanced debugging capabilities **Answer: b)** d) Decreased memory usage	K1	CO2
14.	Which of the following best describes the life cycle of a thread in Java**?** a) New -> Ready -> Running -> Waiting -> Terminated b) New -> Blocked -> Runnable -> Terminated c) Ready -> Running -> Waiting -> Blocked -> Terminated d) New -> Waiting -> Terminated -> Blocked **Answer**: A) New -> Ready -> Running -> Waiting -> Terminated	K1	CO2

15.	What is the potential issue with thread synchronization in multi-threading? a) Deadlock b) Parallelism c) Thread starvation d) Faster execution **Answer**: a)	K1	CO2

PART-B (2 marks)			
SL.NO	**QUESTION**	**BTL**	**CO**
1.	What is a stream? Explain its types.	K1	CO3
2.	List classes that are used by Byte streams for input and output operation.	K1	CO3
3.	List classes that are used by character streams for input and output operation	K1	CO3
4.	What is race condition?	K1	CO3
5.	Define Object Serialization.	K1	CO3
6.	Define Serialization and Deserialization in java with example.	K2	CO3
7.	What is multithreading? State its advantages.	K1	CO3
8.	What is thread?	K1	CO3
9.	Compare thread,process and task.	K2	CO3
10.	Outline thread lifecycle.	K1	CO3
11.	What is the difference between InputStream and OutputStream in Java?	K1	CO3
12.	Explain the concept of object serialization in Java.	K2	CO3
13.	What is the use of ObjectOutputStream and ObjectInputStream?	K1	CO3
14.	Define deserialization. How is it different from serialization?	K1	CO3
15.	What is the purpose of a FileReader class in Java?	K2	CO3
16.	How can you copy a file using Java I/O classes?	K1	CO3
17.	Explain the use of Filter streams in Java I/O.	K2	CO3
18.	What are Pipe Streams in Java?	K1	CO3
19.	What is the function of the BufferedReader class in Java I/O?	K2	CO3
20.	How can you read data from a file using a Scanner class in Java?	K1	CO3

SL.NO	**QUESTION**	**BTL**	**CO**
1	Explain the concepts of Input Streams and Output Streams in Java with suitable examples. Also, discuss object serialization and deserialization, providing a sample program demonstrating object serialization and deserialization to a file.	K3	CO3
2	(b) Describe the life cycle of a thread in Java. Discuss the advantages and common issues associated with multi-threading. Write a simple Java program to create and run a thread, and explain how thread synchronization can be implemented to avoid thread interference.	K3	CO3
3	Describe the **life cycle of a thread** in Java. Explain the different states a thread can be in, and the transitions between these states with an example or diagram.	K2	CO3
4	Explain the concept of **Input Streams** and **Output Streams** in Java. Discuss the various classes used for input and output operations in Java and provide a sample program demonstrating how to read and write data from/to files.	K2	CO3
5	Explain the concept of **Filter Streams** and **Pipe Streams** in Java. Provide an example of how they are used for filtering or piping data between threads.	K3	CO3

6	Discuss the **advantages** and **issues** associated with using multi-threading in Java. Explain how multi-threading can improve performance and the potential problems that may arise, such as thread interference.	K2	CO3

UNIT IV : GRAPHICAL USER INTERFACE (GUI)

PART-A			
SL.NO	**QUESTION**	**BTL**	**CO**
1.	**Which of the following is a feature of the AWT (Abstract Window Toolkit) in Java?** A) Lightweight components B) Heavyweight components C) No event handling D) Cannot be used for GUI development	**K1**	**CO4**
2.	**Which of the following layout managers arranges components in a grid of rows and columns?** • A) FlowLayout • B) BorderLayout • C) GridLayout	**K1**	**CO4**
3.	**Which method is called when an applet is first loaded into memory?** A) start() B) init() C) stop() D) destroy()	**K1**	**CO4**
4.	**Which of the following is true about Swing components?** A) Swing components are heavyweight. B) Swing components are dependent on the underlying operating system. C) Swing components are written entirely in Java. D) Swing components are only used for event handling.	**K1**	**CO4**
5.	**What is the purpose of the `ActionListener` interface in Java?** A) To handle mouse events. B) To listen for key events. C) To handle button clicks and other action events. D) To manage window resize events.	**K1**	**CO4**
6.	**In an applet, how do you pass parameters through an HTML tag?** A) Using `<param>` tag within `<applet>` tag. B) Using the `setParameter` method. C) Parameters are passed automatically. D) By defining variables within the applet's Java code	**K1**	**CO4**
7.	**Which method of the `JFrame` class is used to set the window's title?**	**K1**	**CO4**

	A) setTitle() B) setWindowTitle() C) windowTitle() D) title()		
8.	**Which of the following methods in an applet is responsible for cleaning up resources when the applet is destroyed?** A) start() B) init() C) stop() D) destroy()	**K1**	**CO4**
9.	**Which of the following components is a container in Swing?** A) JLabel B) JButton C) JTextField D) JPanel	**K1**	**CO4**
10.	**Which of the following Swing components is used to create a button?** A) JButton B) JTextField C) JList D) JCheckBox	**K1**	**CO4**
11.	**Which layout manager arranges components in five regions: North, South, East, West, and Center?** A) GridLayout B) BorderLayout C) FlowLayout D) CardLayout	**K1**	**CO4**
12.	**Which method is used to make a JFrame visible?** A) show() B) visible() C) setVisible(true) D) display()	**K1**	**CO4**
13.	**What is the default layout manager for a `JPanel` in Swing?** A) BorderLayout B) FlowLayout C) GridLayout D) CardLayout	**K1**	**CO4**
14.	**Which of the following is not a method of the `ActionListener` interface?** A) actionPerformed() B) actionOccurred() C) addActionListener() D) removeActionListener()	**K1**	**CO4**

15.	**15. Which component is used to create a drop-down list in Swing?** A) JList B) JComboBox C) JRadioButton D) JCheckBox	**K1**	**CO4**
16.	**Which of the following is a valid layout manager in AWT?** A) FlowLayout B) GridBagLayout C) BorderLayout D) All of the above	**K1**	**CO4**
17.	**What is the purpose of the ActionListener interface in Java?** A) It handles keyboard events. B) It handles mouse events. C) It handles action events such as button clicks. D) It handles window events	**K1**	**CO4**
18.	**Which method is automatically called when an applet is started?** A) init() B) start() C) stop() D) destroy()	**K1**	**CO4**
19.	**Which of the following is a container class in Swing?** A) JButton B) JTextField C) JPanel D) JLabel	**K1**	**CO4**
20.	**Which method in AWT is used to handle button clicks?** A) buttonPressed() B) actionPerformed() C) handleClick() D) actionEvent()	**K1**	**CO4**

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	PART B Two mark Question		
SL.NO	**QUESTION**	**CO**	**BTL**
1.	What is AWT in Java, and how does it differ from Swing?	CO4	K1
2.	List the basic components provided by AWT for GUI development.	CO4	K1
3.	Explain the difference between lightweight and heavyweight components in Java.	CO4	K1
4.	Describe the role of a layout manager in AWT and Swing.	CO4	K1
5.	Write a simple Java program using AWT to create a window with a button.	CO4	K1
6.	How do you handle button click events using ActionListener in AWT?	CO4	K1

7.	Compare and contrast the `FlowLayout` and `BorderLayout` layout managers in AWT.	CO4	K2
8.	Analyze the life-cycle of an applet and explain each of its stages.	CO4	K2
9.	Evaluate the performance differences between AWT and Swing components for GUI applications in Java.	CO4	K2
10.	Assess the role of `JApplet` in modern web development and its alternatives.	CO4	K2
11.	What is the purpose of the `init()` method in the applet life-cycle?	CO4	K1
12.	What is the difference between the `JButton` and `JCheckBox` in Swing?	CO4	K1
13.	Explain how the `JComboBox` component is used to create a drop-down list in Swing.	CO4	K2
14.	How do you pass parameters from an HTML page to an applet using the `<param>` tag?	CO4	K1
15.	Write an AWT program to demonstrate the use of multiple layout managers in a single window.	CO4	K1
16.	Demonstrate how you can embed an applet in an HTML page with parameters.	CO4	K2
17.	Analyze the differences between `JPanel` and `JFrame` in terms of functionality in a Swing-based application.	CO4	K2
18.	How would you implement event handling for a `JTextField` to perform an action when the user presses the "Enter" key?	CO4	K1
19.	Create a Java Swing application that uses a `JFrame` to display a `JButton` and `JLabel`. When the button is clicked, the label's text should change.	CO4	K2
20.	Design a Swing form using `JTextField`, `JButton`, and `JLabel` to accept a user's name and display it upon clicking a button.	CO4	K2

PART C	**14 Mark Questions**		
Sr.No	**QUESTION**	**CO**	**BTL**
1.	Explain the differences between **AWT** and **Swing** in Java.(7) **b)** Describe the types of components available in **AWT** and give examples of when each might be used.(7)	CO4	K3
2.	**a)** Write a Java program using **AWT** to create a simple user interface that contains a **text field** and a **button**. When the button is clicked, the text entered in the text field should be displayed in a **label** below the text field.(7) **b)** Analyze the event handling process in the above example. How is the button click event captured and processed?(7)	CO4	K2
3.	**a)** Design a Java program that uses **Swing components** to create a login form with two JTextFields (for username and password) and	CO4	K3

	a JButton (for login). When the button is clicked, the entered username and password should be displayed in a dialog box.(7) **b)** Explain how the **Swing layout manager** is used to position the components within the JFrame.(7)		
4.	**a)** Describe the **Applet life-cycle** with respect to the following methods: init(), start(), stop(), and destroy().(7) **b)** Write a small program using **Applet** that demonstrates the use of these methods and shows how parameters can be passed from an HTML page to the applet.(7)	CO4	K3
5.	**a)** Discuss the advantages and disadvantages of using **AWT** vs **Swing** for building modern Java GUI applications.(7) **b)** Design a GUI using **Swing** to demonstrate the use of **JComboBox**, **JRadioButton**, and **JCheckBox**. The GUI should allow the user to select a color from the JComboBox and use checkboxes to select options. Display the selections when the button is clicked.(7)	CO4	K3
6.	Explain the concept of **layout managers** in Java. Compare the **FlowLayout**, **BorderLayout**, and **GridLayout** managers in terms of their use cases and how they differ in arranging components.(7) **b)** Create a user interface using **Swing** that demonstrates the use of **BorderLayout** and **GridLayout** together to arrange buttons and text fields in a panel.(7)	CO4	K2
7.	**a)** Discuss the **Swing** component JFrame in terms of creating a window-based application. What are its key features, and how does it interact with other Swing components?(7) **b)** Create a simple **Swing-based application** that uses **JFrame** to display a title, a text input field, and a button. When the button is clicked, the text entered in the field should be displayed in a message dialog.(7)	CO4	K3

UNIT V- DATABASE CONNECTIVITY (CO5, CO6, K3 – Apply)

PART A (20 – 1 MARK)			
1.	Which of the following interfaces does the JDBC API use to establish a connection with a database? A) Statement B) DriverManager C) Connection D) ResultSet	**CO5**	**K1**
2.	The Connection interface in JDBC is used to: A) Establish a connection with the database B) Create SQL statements	**CO5**	**K1**

	C) Store query results D) Execute SQL queries		
3.	Which method is used to create a Statement object in JDBC? A) createStatement() B) executeQuery() C) getConnection() D) prepareStatement()	**CO5**	**K1**
4.	Which method of the Statement interface is used to execute an SQL SELECT query? A) execute() B) executeUpdate() C) executeQuery() D) executeSelect()	**CO5**	**K1**
5.	What does the ResultSet interface represent in JDBC? A) A collection of SQL queries B) A database connection C) A set of results from an executed query D) A list of SQL statements	**CO5**	**K1**
6.	Which of the following is true about the "executeUpdate()" method in JDBC? A) It is used to execute SQL queries that return a ResultSet. B) It is used to execute SQL statements such as INSERT, UPDATE, DELETE. C) It is used to retrieve data from the database. D) It is used to open a database connection.	**CO5**	**K1**
7.	Which of the following methods is used to fetch the next row in a ResultSet? A) next() B) getRow() C) moveNext() D) fetchNext()	**CO5**	**K1**
8.	In JDBC, which of the following classes is used to manage database connections? A) ConnectionManager B) DriverManager C) DatabaseManager D) StatementManager	**CO5**	**K1**
9.	Which of the following methods can be used to close a Statement object in JDBC?	**CO5**	**K1**

	A) close() B) shutdown() C) release() D) end()		
10.	The "PreparedStatement" interface in JDBC is used to: A) Prepare SQL queries for execution B) Execute complex queries efficiently C) Bind values to SQL queries D) All of the above	**CO5**	**K1**
11.	In JDBC, which method is used to execute a parameterized SQL query in a PreparedStatement? A) execute() B) executeQuery() C) executeUpdate() D) executeWithParams()	**CO5**	**K1**
12.	What will happen if you try to retrieve data from a ResultSet object after calling its close() method? A) The data will be available, but you cannot modify it. B) It will throw an SQLException. C) The connection will be automatically closed. D) The application will hang.	**CO6**	**K1**
13.	In JDBC, how can you retrieve the value of a column from a ResultSet as a String? A) getString() B) getText() C) getColumnValue() D) getData()	**CO6**	**K1**
14.	Which of the following JDBC classes is used to execute stored procedures? A) PreparedStatement B) CallableStatement C) Statement D) ResultSet	**CO5**	**K1**
15.	Which method in the Connection interface is used to set the auto-commit mode? A) setAutoCommit() B) setCommitMode() C) enableAutoCommit() D) beginTransaction()		**K1**

16.	Which of the following methods is used to set the timeout for a database query in JDBC? A) setTimeout() B) setQueryTimeout() C) setConnectionTimeout() D) setExecuteTimeout()		**K1**
17.	Which of the following is the correct order of steps to establish a JDBC connection? A) Load the JDBC driver → Establish a connection → Execute SQL → Close the connection B) Execute SQL → Load the JDBC driver → Establish a connection → Close the connection C) Establish a connection → Execute SQL → Load the JDBC driver → Close the connection D) Load the JDBC driver → Close the connection → Establish a connection → Execute SQL	**CO5**	**K1**
18.	Which of the following methods is used to execute a batch of SQL commands in JDBC? A) executeBatch() B) execute() C) executeUpdateBatch() D) batchExecute()	**CO5**	**K1**
19.	Which of the following statements about JDBC Result Set is true? A) A ResultSet object can only move forward through the data. B) ResultSet objects can move both forward and backward through the data. C) ResultSet objects cannot be used to retrieve data from the database. D) ResultSet objects are not used to manage database connections.	**CO6**	**K1**
20.	What is the primary purpose of the "Driver Manager" class in JDBC? A) To manage database connections B) To load database drivers C) To execute SQL queries D) To handle transactions	**CO5**	**K1**
PART B (2 MARKS)			
1.	What is the purpose of the `Connection` interface in JDBC? List two important methods provided by the `Connection` interface.	**CO5**	**K1**
2.	Explain the role of the `DriverManager` class in JDBC.	**CO5**	**K2**

3.	Describe the JDBC architecture in brief. How does it enable interaction between Java applications and databases?	**CO5**	**K2**
4.	What is the difference between `Statement` and `PreparedStatement` in JDBC? Provide one advantage of using `PreparedStatement`.	**CO5**	**K1**
5.	Explain the process of establishing a connection to a database in JDBC.	**CO5**	**K2**
6.	What is the significance of the `ResultSet` interface in JDBC? How does it help in retrieving data from a database?	**CO6**	**K1**
7.	List and explain two types of JDBC drivers, along with their advantages and disadvantages.	**CO5**	**K1**
8.	How do you execute an SQL `SELECT` statement using JDBC? What methods do you use, and what is the return type of the executed query?	**CO5**	**K1**
9.	Describe the difference between `execute()`, `executeQuery()`, and `executeUpdate()` methods in JDBC.	**CO5**	**K2**
10.	How can you handle SQL exceptions in JDBC? Provide a brief explanation of the `SQLException` class.	**CO5**	**K1**
11.	How would you retrieve a column value from a `ResultSet` using JDBC? Give an example of how to get the value of a column in the form of an integer.	**CO6**	**K1**
12.	explain the purpose of the `setAutoCommit()` method in JDBC. What happens if it is set to `false`?	**CO5**	**K2**
13.	Explain the use of `commit()` and `rollback()` methods.	**CO5**	**K2**
14.	Describe the two types of ResultSet cursors available in JDBC. How do they differ in terms of navigation?	**CO6**	**K2**
15.	What is the significance of the `next()` method in the `ResultSet` interface? How does it affect the iteration of rows?	**CO6**	**K1**
16.	What are the main advantages of using `PreparedStatement` over `Statement` in JDBC?	**CO5**	**K1**
17.	What is the difference between `executeUpdate()` and `executeQuery()` methods in JDBC? Provide an example for each.	**CO5**	**K1**
18.	Explain the concept of "auto-commit" in JDBC. What is its default behavior and how can it be controlled?	**CO5**	**K2**
19.	How can you handle SQL exceptions in JDBC? What are the common methods of the `SQLException` class?	**CO5**	**K1**
20.	What are the different types of JDBC ResultSet?	**CO6**	**K1**
PART C (14 marks)			

1.	Explain the JDBC architecture in detail. Describe how the JDBC API interacts with different types of JDBC drivers.	**CO5**	**K2**
2.	Demonstrate the steps involved in establishing a database connection using JDBC. Explain how to configure the database connection and handle exceptions during this process.	**CO5**	**K2**
3.	Distinguish between Statement, PreparedStatement, and CallableStatement. Discuss their uses, advantages, and how to execute SQL statements using each of them.	**CO5**	**K4**
4.	Discuss how to create and execute SQL queries using JDBC. Provide examples of using executeQuery(), executeUpdate(), and execute(). How are they different, and when should each be used?	**CO5**	**K3**
5.	What is the ResultSet interface in JDBC? Explain the different types of ResultSet and how to use them to retrieve data. Include examples to demonstrate the working of next(), getString(), getInt(), and other ResultSet methods.	**CO6**	**K2**
6.	Explain how JDBC supports transactions. Discuss the importance of using commit() and rollback() methods, and how the setAutoCommit() method affects transaction management. Provide an example of transaction handling using JDBC.	**CO5**	**K2**
7.	Explain the benefits of using batch updates. Provide an example that demonstrates how to add SQL statements to a batch and execute them together.	**CO5**	**K2**
8.	How do you handle SQL exceptions and resource management in JDBC? Develop best practices for closing resources such as Connection, Statement, and ResultSet.	**CO6**	**K3**
9.	What is the purpose of the ResultSet interface in JDBC? Discuss the different types of cursors available in ResultSet, and demonstrate how you can iterate over the rows in a ResultSet.	**CO6**	**K3**
10.	Demonstrate how transactions are handled in JDBC. Explain the role of setAutoCommit(), commit(), and rollback() in transaction management. Provide an example where a transaction is used in a real-world scenario.	**CO5**	**K2**