DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING R20 REGULATION- II-YEAR-I-SEMESTER

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

UNIT 1:

1. **Define Object Oriented Programming**

   Object oriented programming is a programming paradigm which is based on theconcept of classes and objects.

2. **List the Object Oriented Programming Principles**

   a.Class
   b.Object
   c.Data Abstraction d.Data Encapsulatione.Polymorphism
   f.Inheritance g.Dynamic Binding
   h.Message Passing

3. **Define a Class**

   A class is a collection of member variables and methods.

4. **Define an Object**

   An object is an instance of a class.

5. **Define Data Abstraction**

   Data Abstraction refers to the act of representing essential features and hiding theinternal details.

6. **Define Data Encapsulation**

   Data encapsulation refers to the wrapping up of data and methods in to a single unitknown as class.

7. **Define Polymorphism**

   Polymorphism means the ability to take more than one form.

8. **Define Inheritance**

   Inheritance is the process of deriving one class from another class.

9. **Define Dynamic Binding**

   Dynamic binding refers to the linking of a method definition to method call.

10. **Define Message Passing**

    Message Passing refers to the communication between objects.

11. **List java Buzz words**

    Simple
    Object Oriented
    Distributed Secure
    Robust Portable
    Interpreted
    Multithreaded

High performanceDynamic

Platform Independent

12. How Data Abstraction is achieved in java?

Data Abstraction is achieved through access specifiers.There are four types of access specifiers in java Private
Protected
Public Default

13. What is the purpose of private keyword?

If a member variable or method is declared as private then it cannot be accessed outsideof the class.

14. What is the purpose of protected keyword?

If a member variable or method is declared as protected then it can be accessed withinthat class and its derived class.

15. What is the purpose of public keyword?

If a member variable or method is declared as public then it can be accessed anywhereoutside of the class.

16. How Data Encapsulation is achieved in java?

Data Encapsulation is achieved through the concept of class.

17. What are the different types of polymorphism?

Polymorphism is of two types.Static
Polymorphism Dynamic Polymorphism

18. Define Static Polymorphism

Polymorphism exhibited at compile-time is called Static polymorphism.

19. Define Dynamic Polymorphism

Polymorphism exhibited at run-time is called Dynamic Polymorphism.

20. Give an example for Static Polymorphism

Method Overloading

21. Give an example for Dynamic Polymorphism

Method Overriding

22. Define Method Overloading

Method overloading refers to the implementation of a method with different number ofparameters, different type of parameters, different return types and different functionalities.

23. Define Method Overriding

Method overriding refers to the implementation of a method in both base class andderived class with different functionalities.

24. What are the different types of Inheritance?

Inheritance is of different types.Single
Inheritance

Multilevel Inheritance

Multiple Inheritance Hierarchical
InheritanceHybrid Inheritance

25. Define Single Inheritance.

If a class is derived from another class then it is known as Single Inheritance.

26. Define Multilevel Inheritance

If a hierarchy of classes are created through single inheritance then it is known asMultilevel Inheritance.

27. Define Multiple Inheritance.

If a class is derived from multiple base classes then it is known as Multiple Inheritance.

28. Define Hierarchical Inheritance

If multiple classes are derived from a single class then it is known as HierarchicalInheritance

29. Define Hybrid Inheritance

Hybrid Inheritance is a combination of any of the following inheritanceSingle Inheritance
Multilevel Inheritance Multiple
Inheritance Hierarchical Inheritance

30. What is the keyword used for deriving a class from another class?

Extends

UNIT 2:

31. What is the keyword used for deriving a class from an interface?

Implements

32. Define an abstract class

A class which is declared as abstract is called Abstract class.

33. What is the keyword used for inheriting a class from another class?

Extends

34. What is the keyword used for inheriting a class from an interface?

Implements

35. What is the purpose of final keyword?

The final keyword can be used with variables, methods and classes.
If 'final' keyword is used before a variable then its value cannot be changed.If 'final' keyword is used before a method then it cannot be overridden.
If 'final' keyword is used before a class then it cannot be inherited.

36. Define Dynamic Method Dispatch

Dynamic method dispatch is the mechanism by which a call to an overridden methodis resolved at run time, rather than compile time.

37. Define Binding

Binding refers to the linking of a method call to method definition.

38. Define Static binding

The process of linking a method definition to method call at compile-time is calledStatic binding.

39. Define Dynamic Binding

The process of linking a method definition to method call at run-time is calledDynamic Binding

40. Define Byte code

Byte code refers to the intermediate code generated by the java compiler after thecompilation of java source program and it can be executed on any platform.

41. Why java is Platform independent?

Java is Platform independent because of the generation of byte code.

42. What is the full form of JDK?

JDK stands for Java Development Kit

43. What is the full form of JVM?

JVM stands for Java Virtual Machine.

44. What is the full form of JRE?

JRE stands for Java Run-time environment

45. Define JDK.

Java Development Kit (JDK) is a cross-platform software development environmentthat offers a collection of tools and libraries necessary for developing Java-based software applications

46. Define JVM

Java Virtual Machine (JVM) acts as a run-time engine to run Java applications.

47. Define JRE

Java Runtime Environment (JRE) is an installation package that provides anenvironment to only run (not develop) the java programs.

48. Define an Interface

An interface is a collection of static constants and abstract methods.

49. Define a Package

A package is a collection of classes, interfaces and sub packages.

50. What are the different types of Packages?

Packages are of two types. They are

1. Built-in packages
2. User defined packages

51. What is a Built-in Package?

A package which is available within java software is called Built-in package.

52. What is an User defined Package?

A package which is created by the user is called User defined Package.

53. Name some of the Packages

java.io.*; java.util.*;
java.awt.*;
java.applet.*;
javax.swing.*;

54. What is the syntax for creating a package?

A package can be created using the 'package' keyword.
E.g. package p1;

54. What are the different methods of accessing a java package?

There are three methods to access a package

1. import packagename.classname;
2. import pacakgename.*;
3. fully qualified name

55. Define Recursion

Recursion is the process of calling a function by itself.

56. Give four examples of Recursion Computing the Factorial of a NumberImplementing Towers of Hanoi Computing the GCD of two numbersQuick Sort

57. What are the different types of control statements in java?

Decision making statements (selection statements)Looping statements

Jump statements

58. What are Decision Making statements in java?

Statements which are executed based on a condition are called Decision makingstatements.

If statement
If-else statement
If-else if-else statementNested if
statement Switch statement

59. What is the syntax of if statement in java?

```
if(conditional expression)
{
    Statement;
 }
```

60. What is the syntax of if-else statement in java?

```
if(conditional expression)
{
   Statement;
}
else
{
Statement;
}
```

61. What is the syntax of if-elseif-else statement in java?

```
if(conditional expression-1)
{
 statement-1;
}
elseif(conditional expression-2)
```

```
{
 statement-2;
}
else
{
 statement-3;
}
```

62. What is the syntax of Nested if statement?

```
if(conditional expression-1)
{
    if(conditional expression-2)
    {

     statement-1;
     }
    else
    {
      statement-2;
    }
  }
else
{

statement-3;
}
```

63. What is the syntax of switch statement?

```
switch(variable)
{
    case expression-1:
                                statement-1;
                                break;
   case expression-2:
                                statement-2;
                                 break;
   case expression-n:
                                statement-n;
                                break;
default:

                          statement;
                           break;
}
```

64. What are Looping statements in java?

Statements which are used for performing a task for multiple times are called Loopingstatements.

65. What are the different types of loops in java?

while loop
do-while loopfor
loop

66. What is the syntax of while loop in java?

Initialization expression; while(conditional
expression)

```
{
  Statement;
 Reinitialization expression;
}
```

67. What is the syntax of do-while loop in java?

Initialization expression;do

```
{
 Statement;
Reinitialization expression;
}while(conditional expression);
```

68. What is the syntax of for loop in java?

```
for(initialization expression; conditional expression; re-initialization expression)
{
 Statement;
}
```

69. What are jump statements in java?

Statements which are used to make the control to move from one location to anotherare called jump statements.
break
continue

70. What is the purpose of break statement?

The break keyword is used to make the control come out of the loop.

71. What is the purpose of continue statement?

The continue statement is used to skip an iteration in a loop and move on to the nextiteration

72. Define a String

A string is an object representing a sequence of characters.

73. List some of the methods of String class

length( ) strcat( )
strcmp( )
toUpperCase( )
to Lowercase( )

74. Define Garbage Collection

Garbage Collection refers to the process of reclaiming the memory for unreferencedobjects

75. What are the methods used for Garbage Collection?

gc( ) finalize( )

76. How to prevent Inheritance in java

Inheritance can be prevented using final keyword.

77. What is the class used for taking input from the keyboard?

Scanner

BufferedReader

78. Define a Method

A method is a block of statements used to perform a task repetitively.

UNIT 3:

79. Define a Constructor

A constructor is a method which has the same name as that of a class and is used toinitialize the member variables of a class.

80. What are the different types of constructors?

There are three types of constructorsDefault

Constructor

Parameterized constructorCopy

constructor.

81. Define Default Constructor

A constructor without parameters is called a Default constructor

82. Define Parameterized constructor

A constructor with parameters is called a Parameterized constructor

83. Define copy constructor

A constructor which takes an object as an parameter is called a copy constructor

84. Define an Array

An array is a collection of elements of same data type.

85. What are the different types of arrays in java?

Arrays are of three types in java.

1. Single Dimensional array
2. Two Dimensional array
3. Multidimensional array

86. Define Single Dimensional array

An array which contains single row and multiple columns is called a singledimensional array**.**

An element in a single dimensional array can be accessed through a singlesubscript.

87. Define Two Dimensional array

An array which contains two dimensions is known as two dimensional array. An element in a two dimensional array can be accessed through two subscripts.

88. Define Multi dimensional array

An array which contains more than two dimensions is called a Multidimensionalarray.

89. What is the syntax for declaring a single dimensional array?

datatype arrayname[ ] = new datatype[size];

90. Define Exception Handling

Exception handling is a mechanism to handle run-time errors.

91. Define an Exception

An exception is an event which disrupts the normal flow of execution of the program.

92. What are the different types of exceptions?

There are two types of Exceptions.

1. Built-in Exception
2. User defined Exception

93. What is Built-in Exception?

An exception which is available within the java software is called a Built-in Exception.

94. What is User defined Exception?

An exception which is created by the user is called User defined Exception.

95. What are Checked Exceptions?

Exceptions which are checked at compile-time are called Checked Exceptions.

96. What are Unchecked Exceptions?

Exceptions which are not verified at compile-time are called Unchecked Exceptions.

97. What is the super class of all the exceptions and errors in java?

Throwable class is the super class of all the exceptions and errors in java.

98. What are the keywords associated with exception handling?

try catch
finally
throw
throws

99. What is the purpose of try block?

The code which when executed has a chance for occurrence of errors can be placed inthe try block.

100. What is the purpose of catch block?

The errors which occurred in the try block can be caught in the catch block.

101. What is the purpose of finally block?

The statements in the finally block are executed irrespective of the occurrence of theerrors.

102. What is the purpose of throw keyword?

The throw keyword is used for creating a new exception

103. Define a Stream

A stream represents flow of data from source to destination.

104. What are the different types of streams?There are two types of streams in java. Byte Stream
Character Stream

105. Define Byte Stream

When an I/O stream manages data in 8-bit bytes, it is called a byte stream.

106. Define Character Stream

When an I/O stream handles 16-bit Unicode characters, it is called character stream.

107. Name the package used for input output operations

java.io.

108. List five subclasses of InputStream class

ByteArrayInputStream
FilterInputStream
FileInputStream
ObjectInputStream
PipedInputStream

109. List five subclasses of OutputStream class

ByteArrayOutputStream FilterOutputStream
FileOutputStream
ObjectOutputStream
PipedOuputStream

110. Name the predefined stream objects in java There are three predefined stream objects in javaSystem.in
System.out
System.err

111. Define Serialization

The process of converting an object into byte stream is called serialization

112. Define Deserialization

The process of converting byte stream into object is called Deserialization

113. Define Autoboxing

The process of converting a primitive data type into wrapper class object is calledautoboxing

114. Define Unboxing

The process of converting wrapper class object into primitive datatype is calledUnboxing

115. Define ArrayList

ArrayList is a built-in class of collection framework in java.It uses dynamic array for storing the elements.

116. Define LinkedList

LinkedList is a built-in class in collection framework in java.It uses a double linked list for storing the elements.

117. Define HashSet

HashSet is a built-in class of collection framework in java.It uses a hashtable for storage.

118. Define TreeSet

TreeSet is a built-in clas of collection framework in java.

It uses a tree for storing the elements.

119. Define a Priority Queue

A priority queue is a collection of elements in which the elements are processed basedon priority.

120. Define ArrayDeque

The ArrayDeque class provides the facility of using deque and resizable-array.

121. Define Hashtable.

A hashtable is a collection of Key-value pairs.

122. Define Stack

A stack is a predefined class which implements the stack.

123. Define Vector

Vector is like the dynamic array which can grow or shrink its size.

123. Define StringTokenizer class

It is used to break a string into tokens.

124. Define Formatter class

Java Formatter class belongs to java.util package. The class provides the format() method thatprints the data in the table format.

Java Formatter.format() Method

125. What is the purpose of Date class?

Date class represents date and time in java. It provides constructors and methods todeal with date and time in java.

126. What is the purpose of calendar class?

Calendar class is an abstract class that provides methods for converting date between a specific instant in time and a set of calendar fields such as MONTH, YEAR, HOUR, etc

127. What is the purpose of BitSet class?

BitSet **c**lass implements a vector of bits. The BitSet grows automatically as more bitsare needed.

128. What is the purpose of Random class?

It is used to generate a stream of pseudo random numbers.

129. Define a Process

A program in execution is called a process.

130. Define a Thread

A thread is a light weight process.or

A thread is the path followed when executing a program

131. What are the different types of threads?

There are two types of threads

1. User threads
2. Daemon threads

132. What are user threads?

Threads which are created by the user are called user threads.User threads are high priority threads

133. What are Daemon threads?

Threads which are executing in the background are called Daemon threadsDaemon threads are low priority threads

134. What are the two methods of creating a thread?

By extending the Thread class

By implementing the Runnable interface

135. What are the different states involved in the life cycle of a thread?

New born

Runnable

Running

Blocked Dead

136. What is the method used for stopping a thread for particular amount of time?

sleep( )

137. What is the method used for stopping a thread until an event occurs?

wait( )

138. What is the method used for assigning priority to threads?

setPriority( )

139. What is the method used for obtaining the priority of threads?

getPriority( )

140. What are the different priorities that can be used assigned to threads?

MIN_PRIORITY

NORM_PRIORITY

MAX_PRIORITY

UNIT 4:

141. What is an Applet?

An applet is a program that can be embedded in a web page to generate dynamiccontent.

142. What are the states involved in the life cycle of an applet?

init( ) start( )

paint( ) stop( )

destroy( )

143. What is the method used for drawing a line in an applet?

drawLine( )

The syntax of drawLine( ) method is

void drawLine(int startX, int startY,int endX, int endY)

144. What is the method used for drawing a rectangle in an applet?

drawRect( )

The syntax of drawRect( ) method is

void drawRect(int top, int left, int width, int height)

145. What is the method used for drawing a filled rectangle in an applet?

fillRect( )

The syntax of fillRect( ) method is

void fillRect(int top, int left, int width, int height)

146. What is the method used for drawing a rounded rectangle in an applet?

drawRoundRect( )

The syntax of drawRoundRect( ) method is

void drawRoundRect(int top, int left, int width, int height, int xDiam, int yDiam)

147. What is the method used for drawing a filled rounded rectangle in an applet?

fillRoundRect( )

The syntax of fillRoundRect( ) method is

void fillRoundRect(int top, int left, int width, int height, int xDiam, int yDiam)

148. What is the method used for drawing an ellipse in an applet?

drawOval( )

The syntax of drawOval( ) method is

void drawOval(int top, int left, int xDiam, int yDiam)

149. What is the method used for drawing a filled ellipse in an applet?

fillOval( )

The syntax of fillOval( ) method is

void fillOval(int top, int left, int xDiam, int yDiam)

150. What is the method used for drawing an arc in an applet?

drawArc( )

The syntax of drawArc( ) method is

void drawArc(int top, int left, int width, int height, int startAngle, int sweepAngle)

151. What is the method used for drawing an arc in an applet?

fillArc( )

The syntax of fillArc( ) method is

void fillArc(int top, int left, int width, int height, int startAngle, int sweepAngle)

152. What is the method used for drawing a polygon in an applet?

drawPolygon( )

The syntax of drawPolygon( )method is

Void drawPolygon(int x[ ], int y[ ], int numpoints)

153. What is the method used for drawing a filled polygon in an applet?

fillPolygon( )

The syntax of fillPolygon( )method is

void fillPolygon(int x[ ], int y[ ], int numpoints)

154. What is the method used for drawing objects in an applet?public void paint(Graphics g)

{

}

155. What is the full form of AWT?

AWT stands for Abstract Window Toolkit

156. Define AWT?

AWT is an application programming interface for creating graphics and graphicaluser interface.

157. List out AWT components

Label TextField
TextArea
CheckBox
CheckBoxGroupScrollBar
Choice
List Menu
MenuBar

158. List out Swing components

JLabel JTextField
JCheckBox
JRadioButton
JScrollBar JList
JMenu

159. What is the package to be imported for using AWT components?

java.awt.*;

160. What is the package to be imported for using Swing components?

javax.swing.*;

161. What is the package to be imported for using events?

java.awt.event.*;

162. What is an Event?

An event is an object that describes a state change in a source.

163. What is a Source?

A source is an object which generates an event.

164. What is a Listener?

A listener is an object which is notified when an event occurs.

165. List out Event classes ActionEvent

AdjustmentEvent
ComponentEvent
ContainerEvent FocusEvent
Inputevent Itemevent
KeyEvent MouseEvent
MouseWheelEvent
TextEvent WindowEvent

166. List out Listener Interfaces ActionListener
AdjustmentListener
ComponentListener ContainerListener
FocusListener ItemListener
KeyListener MouseListener
MouseMotionListener
TextListener WindowListener

167. When an action event is generated?
An action event is generated when a button is clicked, a list item is double clicked or amenu item is selected.

168. When an adjustment event is generated?
An adjustment event is generated when a scrollbar is manipulated.

169. When a component event is generated?
A component event is generated when a component is hidden, moved, resized orbecomes visible.

170. When a container event is generated?
A container event is generated when a component is added to or removed from acontainer.

171. When a Focus event is generated?
A focus event is generated when a component gains or loses keyboard focus.

172. When an item event is generated?
An item event is generated when a checkbox is selected or deselected, list item is clicked, choice selection is made or checkable menu item is selected or deselected.

173. When a key event is generated?
A key event is generated when an input is received from the keyboard.

174. When a mouse event is generated?
A mouse event is generated when the mouse is moved, dragged, pressed, released,clicked, enter or exits a component

175. When a mouse wheel event is generated?
A mouse wheel event is generated when the mouse wheel is moved.

176. When a text event is generated?
A text event is generated when the value of text field or text area is changed.

177. When a Window event is generated?
A window event is generated when the window is activated, deactivated, iconified,deiconified, opened, closed or quit.

178. what is the method used for handling action events?

```
void actionPerforme(ActionEvent ae)
{
}
```

179. What is the method used for handling adjustment event?

```
void adjustmentValueChanged(AdjustmentEvent ae)
{
}
```

180. What is the method used for handling item events?

```
void itemStatechanged(ItemEvent ie)
{
}
```

181. What are the methods used for handling key events?

```
void keyPressed(KeyEvent ke)
{
}
void keyReleased(Keyevent ke)
{
}
void keyTyped(KeyEvent ke)
{
}
```

182. What are the methods used for handling mouse events?

```
void mousePressed(MouseEvent me)
{
}
void mouseReleased(MouseEvent me)
{
}
void mouseClicked(MouseEvent me)
{
}
void mouseDragged(MouseEvent me)
{
}
void mouseMoved(MouseEvent me)
{
}
void mouseEntered(MouseEvent me)
{
}
void mouseExited(MouseEvent me)
{
}
```

183. what is the method used for handling text event?

```
void textChanged(TextEvent te)
{ }
```

184. What are the methods used for handling component events?

```
void componentHidden(ComponentEvent ce)
{
}
void componentShown(ComponentEvent ce)
{
}
void componentMoved(ComponentEvent ce)
{
}
void componentResized(ComponentEvent ce)
{
}
```

185. What are the methods used for handling container events?

```
void componentAdded(ContainerEvent ce)
{
}
void componentRemoved(ContainerEvent ce)
{
}
```

UNIT 5:

186. What is the full form of JDBC?

JDBC stands for Java Database Connectivity

187. Define JDBC

JDBC is java API that allows java programs to access database management systems

188. Define Frontend

The software which is used to develop user interface is called frontend.

189. Define Backend

The software which is used to store the data is called backend.

190. What is JDBC driver?

JDBC Driver is a software component that enables java application to interact withthe database.

191. What are the different JDBC drivers?

1. JDBC-ODBC Bridge Driver
2. Native API Driver
3. Network Protocol Driver
4. Thin Driver

192. What is JDBC-ODBC Bridge driver?

The JDBC-ODBC bridge driver uses ODBC driver to connect to the database.

193. What is Native API Driver?

The Native API driver uses the client-side libraries of the database.

194. What is Network Protocol Driver?

The Network Protocol driver uses middleware (application server) that convertsJDBC calls directly or indirectly into the vendor-specific database protocol.

195. What is Thin Driver?

The thin driver converts JDBC calls directly into the vendor-specific databaseprotocol.

196. What are the basic steps involved for connecting any java application with thedatabase?

- Register the Driver class
- Create connection
- Create statement
- Execute queries
- Close connection

197 Write the code for registering the driver class

```
Class.forName("oracle.jdbc.driver.OracleDriver");
```

198. Write the code for creating a connection

```
Connection con=DriverManager.getConnection(
"jdbc:oracle:thin:@localhost:1521:xe","system","password");
```

199. Write the code for creating a statement

```
Statement stmt=con.createStatement();
```

200. Write the code for executing a query

```
ResultSet rs=stmt.executeQuery("select * from emp");
```

201. Write the code for closing the connection

```
con.close();
```

202. What are the advantages of swings over AWT?

- Platform independent
- Supports Pluggable Look-and-Feel feature
- Supports MVC architecture

203. What are the different types of Layouts in java?

FlowLayout
BorderLayout
CardLayout
GridLayout