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**RV COLLEGE OF ENGINEERING®**  
**(An Autonomous Institution affiliated to VTU)**  
**IV Semester B. E. Examinations November-2022**  
**Computer Science and Engineering**

**OBJECT ORIENTED PROGRAMMING USING JAVA**

*Time: 03 Hours*

*Maximum Marks: 100*

*Instructions to candidates:*

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2, 7 and 8 are compulsory. Answer any one full question from 3 and 4 & one full question from 5 and 6.

**PART-A**

1	1.1	Pointers are used in C/C++. Why does java not make use of pointers? Justify the reason.	01
	1.2	Which keyword is used to stop or avoid inheriting the given class features by another class?	01
	1.3	Write the difference between equals() method and equality operator(==) in Java.	02
	1.4	Java works as “pass by value” or “pass by reference” phenomenon. Write the reason.	01
	1.5	What is the output of the following code and why? <pre>public class InterviewBit{     public static void main (String[] args)     {         System.out.println('b'+ 'i'+ 't');     } }</pre>	01
	1.6	Will the finally block get executed when return statement is written at the end of try and cat block as shown below? <pre>public int someMethod(int i){     try {         // some statement         return 1;     }catch (Exception e) {         // some statement         Return 999;     } finally {         // finally block statements     } }</pre>	01

1.7	<p>What is the output of the program?</p> <pre> Class demo{ Demo (double x) { System.out.println(x); } } Public class Main extends demo{ Public static void main (String[] args){ Demo d1 = new demo(2); } } </pre>	01
1.8	<p>Examine this code :</p> <pre> List &lt; String &gt; l = new ArrayList &lt; String &gt; (5); l.add("Together"); l.add("always"); l.add("Together"); System.out.print(l.IndexOf("Together") + " "); System.out.print(l.lastIndexOf("Together")); System.out.print(" " + l.indexOf("can")); </pre>	02
1.9	<p>What will be the result of the code fragment?</p> <p>Examine the Code segment, What will be the result?</p> <pre> List &lt; String &gt; list = new ALinkedList &lt;&gt; (); list.add(Quiz); list.add("Three"); list.add("OOPusingJava");  Iterator &lt; Intege &gt; iter = list.iterator();  While(iter.hasNext()) System.out.print(iter.next() + " "); </pre>	02
1.10	<p>What will be the output of the below program?</p> <pre> class ParentClass extents Exception{ }; class ChildClass extends ParentClass { }; public class Tester { public static void main (String[] args) { try { throw new ChildClass(); }catch (ParentClass p) { System.out.println("Caught ParentClass exception"); } catch(ChildClass e) { System.out.println("Caught ChildClass exception"); } } } </pre>	01

1.11	<p>Which of the following classes fail to compile?</p> <pre> interface I1{     Void m1(); }  interface I2 extends I1 {     Void m2(); }  abstract class A implements I1 {     Pubic void m1() {}     Public void m2() {} }  abstract class B implements I2 {}  class C extends A implements I1,I2 {}  class D extends A {} </pre>	01
1.12	<p>Write the output of the following Java Program.</p> <pre> class Test {     Protected int x,y; } Public class Main {     Public static void main (String[] args) {         Test t = new Test();         System.out.println(t.x + &amp;quot; &amp;quot; +t.y);         // System.out.println(&amp;quot;Hello&amp;quot;);} </pre>	01
1.13	Which pattern matching techniques can be used in Regular Expression Processing that is defined by Pattern and implemented in String respectively?	02
1.14	<p>The code segment (below declaration ) represents _____.</p> <pre> Interface SomeFunc&lt;T&gt; {     T func(T t); } </pre>	01
1.15	List the classes that does not inherit Node. They cannot be directly incorporated into a scene graph in JavaFX GUI programming?	02

### PART-B

2	a	<p>Write a program in Java by creating 'Employee' class having data members as empid, name and salary. Accept data for 5 objects using Array of objects. Define the following methods and print the final salary.</p> <ul style="list-style-type: none"> <li>• getInfo() which takes the salary, number of hours of work per day of employee as parameter</li> <li>• AddSal() which add \$10 to salary of the employee if it is less than \$500.</li> <li>• AddWork() which add \$5 to salary of employee if the number of hours of work per day is more than 6 hours.</li> </ul>	08
	b	What is Auto boxing? Write a Java program that demonstrates autoboxing or unboxing.	04

c	Develop a class model (Diagram) for a Railway Reservation system indicating the objects, attributes and operations. Also show the relationships between each object in the system, including Train, Passenger, ticket, payment, clerk and railway system. Identify the attributes, operations, visibility and multiplicities where appropriate. Design a class diagram for the above description and explain the same. Note : Write down any assumptions that you made to explain your answer.	04
3	<p>a Write a Java program to create a base class called Bicycle with member variables (gear speed, color) of type integer and string, methods (applyBrake(int decrement), speedup(int increment)) and constructors Bicyc(int gear, int speed, int color).</p> <p>Derive subclass called MountainBike from the superclass Bicycle with member variable (height) of type integer, public methods (setHegiht(int new Value)) and its constructors (MountainBike (int gear, int speed, String color, int startHeight)). Create the two instances of MountainBikes and print similar Mountain bikes if the color and number of gears of mountain bikes are same.</p> <p>b Demonstrate the code reuse and Inheritance properties of Object-oriented programming by Inheriting the constructors and methods of the base class. List the advantages of user-defined packages ? Tabulate the visibility of java classes and packages.</p> <p style="text-align: center;"><b>OR</b></p>	10 06
4	<p>a Design and implement two interfaces called MobilePhone and MobileInterface.</p> <ul style="list-style-type: none"> <li>MobilePhone Intrface has two abstract methods void makeACall(Long number Integer countryCode) Boolean sendSMS(String message)</li> <li>MobileInteface interface extends MobilePhone interface and has three methods Static method called void printWelcomeMessage() A implemented method in interface called void makeACall(Long number) Abstract method called void capturePhtot() Develop two classes BasicPhone implementing MobilePhone interface and Smartphone implementing MobileInterface</li> </ul> <p>b Write appropriate main method to invoke the above functionalities. Write the differences between abstract class and interface.</p>	10 06
5	<p>a Write a program to take care of Number Format Exception if user enters values other than integer for calculating average marks of 2 students. The name of the students and marks in 3 subjects are taken from the user while executing the program. In the same program write two user defined Exception classes to take care of Negative values and values out of range (ie other than in the range of 0-100).</p> <p>b What are checked and unchecked exceptions? Illustrate with an example code.</p>	10 06

OR			
6	a	Create two threads, one thread to display all even numbers between 1 and 20, another to display odd numbers between 1 and 20. Note : Display all even numbers followed by odd numbers.	08
	b	Explain thread synchronization and inter thread communication in detail. Demonstrate with an example program.	08
7	a	Write the following programs in java: i. To reverse words in a given sentence without using any library method. ii. To find the maximum occurring character in given string.	06
	b	Write the following methods that return a lambda expression performing a specified action: (i) PerformOperation isOdd() : The lambda expression must return true if a number is odd or false if it is even (ii) PerformOperation isPrime () : The lambda expression must return true if a number is prime or false if it is composite (iii) PerformOperation isPalindrome() : The lambda expression must return true if a number is palindrome or false if it is not Write a JAVA program using above lambda expressions to take 2 integers as input where the first integer specifies the condition to check for (case 1 for Odd/Even, case 2 for Prime/Composite or case 3 for Palindrome). The second integer denotes the number to be checked.	10
8	a	Define a generic method called checkOrder() that checks if four items are in ascending, neither, or descending order. The method should return -1 if the items are in ascending order, 0 if the items are unordered and 1 if the items are in descending order. The program reads four items from input and outputs if the items are ordered. The items can be different types, including integers, strings, character or doubles.	10
	b	What is Stage in JavaFX? Explain the different inbuilt layout panes.	06