



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION  
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WINTER – 2016 EXAMINATION

Model Answer

Subject Code: 17515

**Important Instructions to examiners:**

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q.N o.	Sub Q.N.	Answer	Marking Scheme
1.	(A) (a) Ans.	<b>Attempt any THREE of the following:</b> <b>How java is different than other programming language?</b> Java is different from the other programming languages with respect to the following features: <ol style="list-style-type: none"><li>i. Java has a very rich API which provides a huge number of features.</li><li>ii. Java is an object oriented language:- It follows all the principles of object oriented programming namely inheritance, polymorphism and abstraction. Multiple inheritance is possible with the concept of interface.</li><li>iii. Java is both compiled and interpreted:- Most of the programming languages either uses a compiler or an interpreter. Java programs are to be compiled to get an intermediate byte code (a.class file) and then interpreted making it more secure and platform independent.</li><li>iv. Java is secure:<ul style="list-style-type: none"><li>• Java does not use pointer</li><li>• Java programs run inside a virtual machine</li><li>• Classloader adds security by separating the package for the classes of the local file system from those that are imported from network sources.</li></ul></li></ol>	<b>12</b> <b>4M</b>  <b>Any 4</b> <b>points-</b> <b>1M</b> <b>each</b>



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		<ul style="list-style-type: none"> <li>• Bytecode Verifier checks the code fragments for illegal code that can violate access right to objects.</li> <li>• Security Manager determines what resources a class can access such as reading and writing to the local disk</li> </ul> <p>V. Robust: Java uses strong memory management. The lack of pointers avoids security problem. There is automatic garbage collection in java. There is exception handling and type checking mechanism in java.</p> <p>vi. Architecture-neutral: There is no implementation dependent features e.g. size of primitive types is fixed.</p> <p>Vii. Portable: We may carry the java bytecode to any platform.</p> <p>Viii Distributed          We can create distributed applications in java. RMI and EJB are used applications. We may access files by calling the methods from any ma</p> <p>ix. Multi-threaded: A thread is like a separate program, executing concurrently. We can write Java programs that deal with many tasks at once by defining multiple threads. The main advantage of multi-threading is that it doesn't occupy memory for each thread. It shares a common memory area. Threads are important for multi-media, Web applications etc.</p>	
	<p><b>(b)</b>           Ans.</p>	<p><b>What is scope of variable? Give example of class variable, instance variable and local variable.</b></p> <p>The scope of a variable defines the section of the code in which the variable is visible. The variables can be class variable which is associated with the class and is shared with all the instances of the class or an instance variable which is declared in a class and each instance has a separate copy or a local variable which is defined in a block or a method. As a general rule, variables that are defined within a block are not accessible outside that block. The lifetime of a variable refers to how long the variable exists before it is destroyed.</p> <p><b>Eg:</b>          class VariableTypes          {          static int a = 0; //class variable          int b = 0; // instance variable          VariableTypes()          }</p>	<p style="text-align: center;"><b>4M</b></p> <p style="text-align: center;"><i>Definitio          n of          scope –          1M</i></p> <p style="text-align: center;"><i>A          program          or          suitable          example          should</i></p>



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		<pre> { a++; b++; int c = 0;    //local variable c++; System.out.println("In constructor printing a: "+a);//will be accessed System.out.println("In constructor printing b: "+b);//will be accessed System.out.println("In constructor printing c: "+c);//will be accessed } public static void main(String ar[]) { VariableTypes s = new VariableTypes(); VariableTypes s1 = new VariableTypes(); VariableTypes s2 = new VariableTypes(); System.out.println("in main printing a: "+VariableTypes.a);//will be accessed System.out.println("in main printing b: "+s.b);//will be accessed System.out.println("in main printing c "+s.c);//will not be accessed because this is a local variable declared in constructor } } </pre>	<p style="text-align: center;"><i>be considered - 3M</i></p> <p style="text-align: center;"><i>(class, instance and local variables should be declared and marked clearly – each 1M)</i></p>
	<p>(c) Ans.</p>	<p><b>What is an exception? How it is handled? Give suitable example. (Note: Any suitable example should be considered)</b></p> <p>An exception is an event, which occurs during the execution of a program, that disrupts the normal flow of the program execution.</p> <p>An exception handler will handle the exception using the keywords</p> <ol style="list-style-type: none"> <li>i. try</li> <li>ii. catch</li> <li>iii. throw</li> <li>iv. throws</li> <li>v. finally</li> </ol> <p><b>Eg:</b></p> <pre> import java.io.*; class ExceptionHandling { int num1, num2, answer; void acceptValues() { BufferedReader bin = new BufferedReader(new InputStreamReader(System.in)); try </pre>	<p style="text-align: center;"><b>4M</b></p> <p style="text-align: center;"><i>Definition of exception 1M</i></p> <p style="text-align: center;"><i>Keywords 1M</i></p>



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		<pre> { System.out.println("Enter two numbers"); num1 = Integer.parseInt(bin.readLine()); num2 = Integer.parseInt(bin.readLine()); } catch(IOException ie) { System.out.println("Caught IOException"+ie); } catch(Exception e) { System.out.println("Caught the exception "+e); } } void doArithmetic() { acceptValues(); try { answer = num1/num2; System.out.println("Answer is: "+answer); } catch(ArithmeticException ae) { System.out.println("Divide by zero"+ae); } } public static void main(String a[]) { ExceptionHandling e = new ExceptionHandling(); e.doArithmetic(); } } </pre>	<p><b>Example</b> <b>2M</b></p>
	<p><b>(d)</b> Ans.</p>	<p><b>Explain methods of map class and set class in jdk frame work. The methods declared in the interface Map are:</b></p> <p>void <b>clear()</b>-Removes all of the mappings from this map (optional operation).</p> <p>boolean <b>containsKey(Object key)</b>-Returns true if this map contains a mapping for the specified key.</p> <p>boolean <b>containsValue(Object value)</b>-Returns true if this map maps one or more keys to the specified value.</p> <p><b>Set&lt;Map.Entry&lt;K,V&gt;&gt; entrySet()</b> - Returns a <b>Set</b> view of the mappings contained in this map.</p>	<p><b>4M</b></p> <p><b>Any 2 methods of map and any 2 methods of set</b> <b>2M each</b></p>



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	<p>boolean <b>equals(Object o)</b> - Compares the specified object with this map for equality.</p> <p><b>get(Object key)</b> - Returns the value to which the specified key is mapped, or null if this map contains no mapping for the key.</p> <p>int <b>hashCode()</b>-Returns the hash code value for this map.</p> <p>boolean <b>isEmpty()</b> - Returns true if this map contains no key-value mappings.</p> <p><b>Set&lt;K&gt;keySet()</b> -Returns a <b>Set</b> view of the keys contained in this map</p> <p><b>remove(Object key)</b> -Removes the mapping for a key from this map if it is present (optional operation).</p> <p>Int <b>size()</b> - Returns the number of key-value mappings in this map.</p> <p><b>Collection&lt;V&gt;values()</b> - Returns a <b>Collection</b> view of the values contained in this map.</p> <p><b>The methods declared in the Set interface are:</b></p> <p>boolean <b>add(E e)</b>-Adds the specified element to this set if it is not already present</p> <p>boolean <b>addAll(Collection&lt;? extends E&gt; c)</b> Adds all of the elements in the specified collection to this set if they're not already present (optional operation).</p> <p>void <b>clear()</b>-Removes all of the elements from this set (optional operation).</p> <p>boolean <b>contains(Object o)</b>-Returns true if this set contains the specified element.</p> <p>boolean <b>containsAll(Collection&lt;?&gt; c)</b>-Returns true if this set contains all of the elements of the specified collection.</p> <p>boolean <b>equals(Object o)</b>-Compares the specified object with this set for equality.</p> <p>int <b>hashCode()</b>-Returns the hash code value for this set.</p> <p>boolean <b>isEmpty()</b>-Returns true if this set contains no elements.</p> <p><b>Iterator&lt;E&gt;iterator()</b>-Returns an iterator over the elements in this set.</p> <p>boolean <b>remove(Object o)</b>-Removes the specified element from this set if it is present (optional operation).</p> <p>boolean <b>removeAll(Collection&lt;?&gt; c)</b>-Removes from this set all of its</p>	
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	<pre> } int volume(int l, int w, int d) { return l*w*d; } public static void main(String args[]) { BufferedReader bin = new BufferedReader(new InputStreamReader(System.in)); try { System.out.println("Enter the length, width and depth"); int l = Integer.parseInt(bin.readLine()); int w = Integer.parseInt(bin.readLine()); int h = Integer.parseInt(bin.readLine()); Box b = new Box(l,w,h); Rectangle r = new Rectangle(l,w); System.out.println("Area of the Rectangle is :"+r.area()); System.out.println("Area of the Box is :"+b.area()); System.out.println("volume of the Rectangle is :"+b.volume(l,w,h)); } catch(Exception e) { System.out.println("Exception caught"+e); } } } </pre>	
<p><b>(b)</b></p>	<p><b>Write a java program.</b></p> <div style="text-align: center;"> <pre> classDiagram     class Exam {         &lt;&lt;interface&gt;&gt;         exam()         per_cal()     }     class Student {         name         roll-no         m1         m2     }     class ResultDisplay {         display()     }     Exam &lt; -- Student     Exam &lt; -- ResultDisplay </pre> </div> <p>Ans. <code>import java.io.*;</code>  <code>class Student</code>  <code>{</code>  <code>String name;</code></p>	<p align="right"><b>6M</b></p>



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	<pre>int roll_no; double m1, m2; Student(String name, int roll_no, double m1, double m2) { this.name = name; this.roll_no = roll_no; this.m1 = m1; this.m2 = m2; } } interface exam { public void per_cal(); } class result extends Student implements exam { double per; result(String n, int r, double m1, double m2) { super(n,r,m1,m2); } public void per_cal() { per = ((m1+m2)/200)*100; System.out.println("Percentage is "+per); } void display() { System.out.println("The name of the student is"+name); System.out.println("The roll no of the student is"+roll_no); per_cal(); } public static void main(String args[]) { BufferedReader bin = new BufferedReader(new InputStreamReader(System.in)); try { System.out.println("Enter name, roll no mark1 and mark 2 of the student"); String n = bin.readLine(); int rn = Integer.parseInt(bin.readLine());</pre>	<p><i>Correct Syntax 3M, Correct logic 3M</i></p>
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		<pre>double m1 = Double.parseDouble(bin.readLine()); double m2 = Double.parseDouble(bin.readLine()); result r = new result(n,rn,m1,m2); r.display(); } catch(Exception e) { System.out.println("Exception caught"+e); } } }</pre>	
<b>2.</b>	<b>(a)</b>	<p><b>Attempt any TWO of the following:</b>  <b>Write a program to create a class Account having variable accno, accname and balance. Define deposit ( ) and withdraw( ) methods. Create one object of class and perform the operation.</b></p> <p>Ans.</p> <pre>import java.io.*; class Account { int accno; String accname; double balance, new_bal; Account(int accno, String accname, double balance) { this.accno = accno; this.accname = accname; this.balance = balance; } void deposit(double deposit_amount) { balance = balance+deposit_amount; System.out.println("Your new available balance is"+balance); } void withdraw(double amount) { if(balance &gt; amount) { balance = balance-amount; System.out.println("Your current balance"+balance); } else if( balance == amount) { System.out.println("Your current balance is "+balance+". Your</pre>	<p><b>16</b> <b>8M</b></p> <p><i>Correct logic 5M, Correct syntax 3M</i></p>



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		<pre>minimum balance should be 1000. Hence cannot withdraw."); } else { System.out.println("Insufficient balance"); } } public static void main(String args[]) { BufferedReader bin = new BufferedReader(new InputStreamReader(System.in)); Account a; double amount, bal; try { System.out.println("Enter the account name account number and balance"); String a_name = bin.readLine(); int a_no = Integer.parseInt(bin.readLine()); bal = Double.parseDouble(bin.readLine()); a = new Account(a_no, a_name, bal); System.out.println("Enter\n 1 for depositing \n 2 for withdrawal"); int option = Integer.parseInt(bin.readLine()); switch(option) { case 1: System.out.println("Enter the amount to deposit"); amount = Double.parseDouble(bin.readLine()); a.deposit(amount); break; case 2: System.out.println("Enter the amount to withdraw"); amount = Double.parseDouble(bin.readLine()); a.withdraw(amount); break; default: System.out.println("Enter a valid option"); break; } } catch(Exception e) {</pre>	
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		<pre>System.out.println("Exception caught"+e); } } }</pre>	
	<b>(b)</b>	<p><b>How multiple inheritance is achieved in java? Explain with proper program.</b>  <i>(Note: Any proper program should be considered)</i></p> <p>Inheritance is a mechanism in which one object acquires all the properties and behaviors of parent object. The idea behind inheritance in java is that new classes can be created that are built upon existing classes.</p> <p>Multiple inheritance happens when a class is derived from two or more parent classes. Java classes cannot extend more than one parent classes, instead it uses the concept of interface to implement the multiple inheritance.</p> <p>It contains final variables and the methods in an interface are abstract. A sub class implements the interface. When such implementation happens, the class which implements the interface must define all the methods of the interface. A class can implement any number of interfaces.</p> <p><b>Eg:</b></p> <pre>import java.io.*; class Student { String name; int roll_no; double m1, m2; Student(String name, introll_no, double m1, double m2) { this.name = name; this.roll_no = roll_no; this.m1 = m1; this.m2 = m2; } } interface exam { public void per_cal(); } class result extends Student implements exam { double per; result(String n, int r, double m1, double m2)</pre>	<p><b>8M</b></p> <p><b>Explanation 3M</b></p> <p><b>Example 5M</b>  <b>(Correct syntax – 2M, logic 3M)</b></p>



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		<pre> { super(n,r,m1,m2); } public void per_cal() { per = ((m1+m2)/200)*100; System.out.println("Percentage is "+per); } void display() { System.out.println("The name of the student is"+name); System.out.println("The roll no of the student is"+roll_no); per_cal(); } public static void main(String args[]) { BufferedReader bin = new BufferedReader(new InputStreamReader(System.in)); try { System.out.println("Enter name, roll no mark1 and mark 2 of the student"); String n = bin.readLine(); int rn = Integer.parseInt(bin.readLine()); double m1 = Double.parseDouble(bin.readLine()); double m2 = Double.parseDouble(bin.readLine()); result r = new result(n,rn,m1,m2); r.display(); } catch(Exception e) { System.out.println("Exception caught"+e); } } } </pre>	
(c)	<b>Write an applet program that accepts two input, strings using &lt;Param&gt; tag and concatenate the strings and display it in status window.</b>	<pre> import java.applet.*; import java.awt.*; /*&lt;applet code = AppletProgram.class height = 400 width = 400&gt; &lt;param name = "string1" value = "Hello"&gt; &lt;param name = "string2" value = "Applet"&gt; &lt;/applet&gt;*/ public class AppletProgram extends Applet { </pre>	<b>8M</b>  <i>Correct logic 5M, Correct Syntax 3M</i>
Ans.			



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		<pre>String str1; public void init() { str1 = getParameter("string1").concat(getParameter("string2")); } public void paint(Graphics g) { showStatus(str1); } }</pre>													
<b>3.</b>	<b>(a)</b>	<p><b>Attempt any FOUR of following:</b></p> <p><b>How garbage collection is done in Java? Which methods are used for it?</b></p> <ul style="list-style-type: none"> <li>• Garbage collection is a process in which the memory allocated to objects, which are no longer in use can be freed for further use.</li> <li>• Garbage collector runs either synchronously when system is out of memory or asynchronously when system is idle.</li> <li>• In Java it is performed automatically. So it provides better memory management.</li> </ul> <p><b>Method used for Garbage Collection:</b>  The java.lang.Object.finalize() is called by garbage collector on an object when garbage collection determines that there are no more reference to the object.  A subclass override the finalize method to dispose of system resources or to perform other cleanup.</p> <p><b>General Form :</b></p> <pre>protected void finalize() { // finalization code here }</pre>	<p><b>16</b> <b>4M</b></p> <p><i>Garbage Collection</i> <i>n</i> <i>Explanation:2M</i></p> <p><i>Method :2M</i></p>												
	<b>(b)</b>	<p><b>What is the difference between vector and array? Give suitable example.</b></p> <table border="1"> <thead> <tr> <th align="center">Sr. No</th> <th align="center">Vector</th> <th align="center">Array</th> </tr> </thead> <tbody> <tr> <td align="center">1</td> <td>Vector can grow and shrink dynamically.</td> <td>Array can't grow and shrink dynamically.</td> </tr> <tr> <td align="center">2</td> <td>Vector can hold dynamic list of objects or primitive data types.</td> <td>Array is a static list of primitive data types.</td> </tr> <tr> <td align="center">3</td> <td>Vector class is found in java.util package</td> <td>Array class is found in java.lang (default) package.</td> </tr> </tbody> </table>	Sr. No	Vector	Array	1	Vector can grow and shrink dynamically.	Array can't grow and shrink dynamically.	2	Vector can hold dynamic list of objects or primitive data types.	Array is a static list of primitive data types.	3	Vector class is found in java.util package	Array class is found in java.lang (default) package.	<p><b>4M</b></p> <p><i>Any 3 Difference points : 1M each , Example :1M</i></p>
Sr. No	Vector	Array													
1	Vector can grow and shrink dynamically.	Array can't grow and shrink dynamically.													
2	Vector can hold dynamic list of objects or primitive data types.	Array is a static list of primitive data types.													
3	Vector class is found in java.util package	Array class is found in java.lang (default) package.													



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		4	Vector can store elements of different data types.	Array can store elements of same data type.	
		5	Vector class provides different methods for accessing and managing vector elements.	For accessing element of an array no special methods are available as it is not a class, but a derived type.	
		6	<b>Syntax :</b> Vector objectname=new Vector();	<b>Syntax :</b> datatype[] arrayname=new datatype[size];	
		<b>Example</b>	Vector v1=new Vector();	int[] myArray={22,12,9,44};	
	(c)  Ans.	<p><b>Write a program to compute the sum of the digits of a given integer numbers.</b>  <i>(Note: Direct Input or User Defined Input shall be considered &amp; Any Other Logic shall be considered)</i></p> <pre> class Sumdigit { public static void main(String args[]) { int num = Integer.parseInt(args[0]); //takes argument as commandline int remainder, result=0; while(num&gt;0) { remainder = num%10; result = result + remainder; num = num/10; } System.out.println("Sum of digit of number is : "+result); } } </pre>			<p><b>4M</b></p> <p><i>Logic : 2M, Syntax : 2M</i></p>
	(d)  Ans.	<p><b>Explain following methods:</b>  <b>(i) drawrect ( )</b>  <b>(ii) getfont ( )</b></p> <p><b>(i) drawrect ( ):</b>  <b>Syntax: void drawRect(int x, int y, int width, int height)</b>  Used to draw a rectangle with upper left corner at (x,y) and with specified width and height.</p>			<p><b>4M</b></p> <p><i>drawRect method:</i></p>



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		<p><b>(ii) getFont ( ):</b>  <b>public static Font getFont(String nm)</b>  Returns a font from the system properties list.  <b>Parameters:</b>  nm - the property name.</p> <p><b>public static Font getFont(String nm, Font font)</b>  Returns the specified font from the system properties list.  <b>Parameters:</b>  nm - the property name.  font - a default font to return if property 'nm' is not defined.</p>	<i>Syntax– 1M, Use- 1M</i>  <i>getFont method :Syntax - 1M, Use - 1,</i>  <i>Any one method</i>						
	<p><b>(e)</b>   Ans.</p>	<p><b>Write a program that will count no. of characters in a file.</b>  <i>(Note: Any Other Logic shall be considered)</i></p> <pre>import java.io.*; class CountChars { public static void main(String args[]) { try { FileReader fr=new FileReader("a.txt"); int ch; int c=0; while((ch=fr.read())!=-1) { c++; //increase character count } fr.close(); System.out.println(c); } catch(Exception e) {} } }</pre>	<p><b>4M</b></p>  <p><i>Logic : 2M, Syntax : 2M</i></p>						
<b>4.</b>	<p><b>(A)</b> <b>(a)</b>   Ans.</p>	<p><b>Attempt any THREE of following:</b>  <b>In what ways does a switch statement differ from an if statements?</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: center;">Sr. No.</th> <th style="width: 40%; text-align: center;">Switch</th> <th style="width: 50%; text-align: center;">If</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>The switch statement is used to select among multiple alternatives</td> <td>The if statement is used to select among two alternatives.</td> </tr> </tbody> </table>	Sr. No.	Switch	If	1	The switch statement is used to select among multiple alternatives	The if statement is used to select among two alternatives.	<p><b>12</b> <b>4M</b></p>
Sr. No.	Switch	If							
1	The switch statement is used to select among multiple alternatives	The if statement is used to select among two alternatives.							





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		<pre>sum=sum+i; numcnt++; } } System.out.println(" No of elements : "+numcnt); System.out.println(" Sum of elements : "+sum); } }</pre>	
	(c)	<p><b>What is synchronization? When do we use it? Explain synchronization of two threads.</b>  <i>(Note: Any other program shall be considered)</i></p> <p><b>Synchronization :-</b>  When two or more threads need access to a shared resource, they need some way to ensure that the resource will be used by only one thread at a time. The process by which this is achieved is called synchronization.</p> <p><b>Synchronization used when we want to -</b></p> <ol style="list-style-type: none"> <li>1) prevent data corruption.</li> <li>2) prevent thread interference.</li> <li>3) Maintain consistency If multiple threads require an access to an object</li> </ol> <p><b>Program based on synchronization:</b></p> <pre>class Callme { void call(String msg) { System.out.print("[ " +msg); try { Thread.sleep(1000); } catch(InterruptedException e) { System.out.println("Interrupted "); } System.out.print("]"); } } class Caller implements Runnable {</pre>	<p style="text-align: right;"><b>4M</b></p> <p style="text-align: right;"><b>Synchro nization: 1M</b></p> <p style="text-align: right;"><b>Any one Use:1M</b></p> <p style="text-align: right;"><b>Program :2M</b></p>



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	<pre>String msg; Callme target; Thread t; public Caller(Callmetarg,String s) { target=targ; msg=s; t=new Thread(this); t.start(); } public void run() { <b>synchronized(target)</b> { target.call(msg); } } class Synch { public static void main(String args[]) { Callme target=new Callme(); Caller ob1=new Caller(target,"Hello"); Caller ob2=new Caller(target,"Synchronized"); try { ob1.t.join(); ob2.t.join(); } catch(InterruptedException e) { System.out.println("Interrupted "); } } }</pre>	
(d) Ans.	<b>Draw the hierarchy of Writer stream classes, and hierarchy of Reader stream classes.</b>	<b>4M</b>

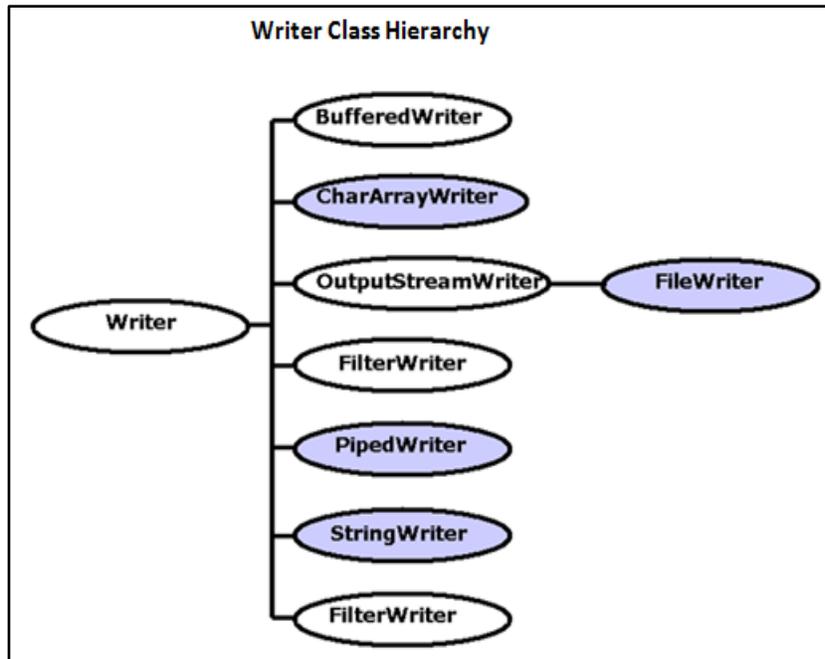


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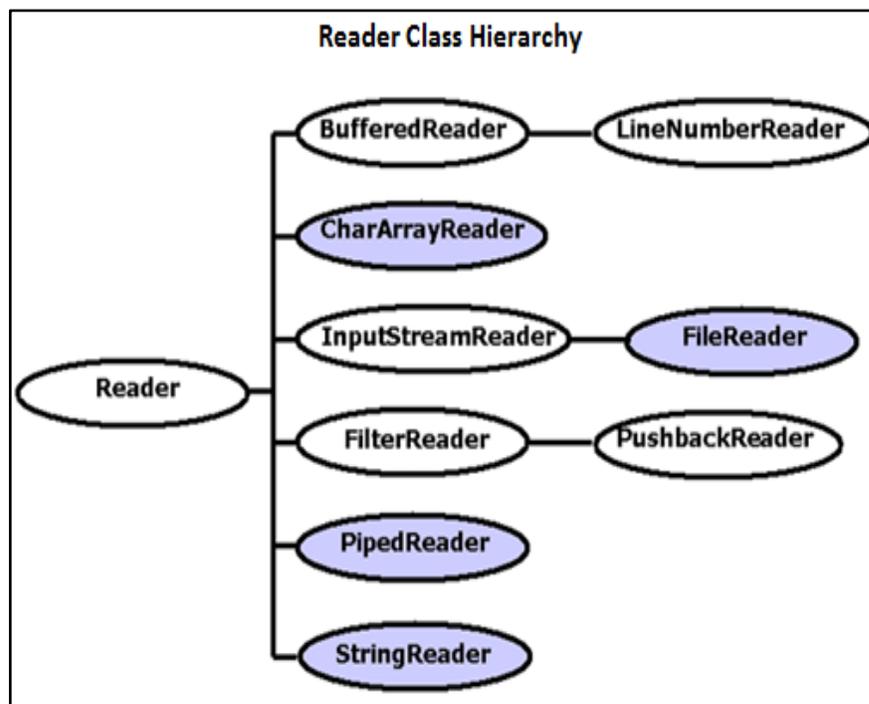
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<b>4.</b>	<b>(B)</b> <b>(a)</b>  Ans.	<b>Attempt any ONE of following:</b> <b>What are the access control parameters? Explain the concept with suitable example.</b> Java provides a number of access modifiers to set access levels for classes, variables, methods and constructors. <b>1) Default Access Modifier - No keyword:</b> A variable or method declared without any access control modifier is available to any other class in the same package. Visible to all class in its package. <b>E.g:</b> Variables and methods can be declared without any modifiers, as in the following <b>Examples:</b> <pre>String version = "1.5.1"; boolean processOrder() {     return true; }</pre> <b>2) Private Access Modifier - private:</b> Methods, Variables and Constructors that are declared private can only be accessed within the declared class itself. Private access modifier is the most restrictive access level. Class and interfaces cannot be private. Using the private modifier is the main way that an object encapsulates itself and hide data from the outside world. <b>Examples:</b> <pre>private String format; private void get() { }</pre> <b>3) Public Access Modifier - public:</b> A class, method, constructor, interface etc declared public can be accessed from any other class. Therefore fields, methods, blocks declared inside a public class can be accessed from any class belonging to the Java Universe. However if the public class we are trying to access is in a different package, then the public class still need to be imported. Because of class inheritance, all public methods and variables of a class are inherited by its subclasses. <b>Examples:</b> <pre>public double pi = 3.14; public static void main(String[] arguments) {</pre>	<b>6</b> <b>6M</b>  <i>Any 4 paramet ers explanat ion: 1M each, Example : 1/2M each</i>
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		<pre>// ... }</pre> <p><b>4) Protected Access Modifier - protected:</b>  Variables, methods and constructors which are declared protected in a super class can be accessed only by the subclasses in other package or any class within the package of the protected members' class.  The protected access modifier cannot be applied to class and interfaces. Methods, fields can be declared protected, however methods and fields in a interface cannot be declared protected.  Protected access gives the subclass a chance to use the helper method or variable, while preventing a nonrelated class from trying to use it.  <b>E.g</b>  The following parent class uses protected access control, to allow its child class override <pre>protected void show( ) { }</pre> <p><b>5) private protected:</b> Variables, methods which are declared protected in a super class can be accessed only by the subclasses in same package. It means visible to class and its subclasses.  <b>Example:</b> <pre>private protected void show( ) { }</pre> </p></p>	
	<p>(b)</p> <p>Ans.</p>	<p><b>Describe following methods of applet:</b>  <b>(i) suspend ( ) (ii) resume ( )</b>  <b>(iii) sleep ( ) (iv) notify ( )</b>  <b>(v) stop ( ) (vi) wait ( )</b>  <i>(Note: consider these Methods as Thread Methods)</i></p> <p><b>i) suspend():</b>  <b>syntax : public void suspend()</b>  This method puts a thread in suspended state and can be resumed using resume()method.</p> <p><b>ii) resume():</b>  <b>syntax : public void resume()</b>  This method resumes a thread which was suspended using suspend() method.</p> <p><b>iii)sleep():</b>  <b>syntax: public static void sleep(long millis) throws</b></p>	<p><b>6M</b></p> <p>.</p> <p><b>Each method use :1M</b></p>



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		<p><b>InterruptedException</b>          We can put a thread to sleep for a specified time period using sleep(time) where time is in ms. It reenters the runnable state as soon as period has elapsed /over.</p> <p><b>iv) notify():</b>  <b>syntax: public final void notify()</b>          Notify() method wakes up the first thread that called wait() on the same object.</p> <p><b>v) stop():</b>  <b>syntax: void stop()</b>          Used to kill the thread. It stops thread.</p> <p><b>vi) wait():</b>  <b>syntax : public final void wait()</b>          This method causes the current thread to wait until another thread invokes the notify() method or the notifyAll() method for this object.</p>	
<b>5.</b>	<p><b>(a)</b>  <b>Write a thread program for implementing the ‘Runnable interface’.</b></p> <p>Ans.</p>	<p><b>Attempt any TWO of following:</b>  <b>Write a thread program for implementing the ‘Runnable interface’.</b></p> <pre>//program to print even numbers from 1 to 20 using Runnable Interface class mythread implements Runnable { public void run() { System.out.println("Even numbers from 1 to 20 : "); for(int i= 1 ; i&lt;=20; i++) { if(i%2==0) System.out.print(i+ " "); } } } class test { public static void main(String args[]) { mythreadmt = new mythread(); Thread t1 = new Thread(mt); t1.start();</pre>	<p><b>16</b>  <b>8M</b></p> <p><i>Class implementing Runnable 2M</i></p> <p><i>Correct run() method 2M</i></p> <p><i>Proper use of Thread class 2M</i></p> <p><i>Correct Logic and</i></p>



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		} }	<i>Syntax</i> <i>2M</i>
(b)	<b>Define an exception called ‘No match Exception’ that is thrown when a string is not equal to “MSBTE”. Write program.</b>		<i>8M</i>
Ans.	<pre>//program to create user defined Exception No Match Exception import java.io.*; class NoMatchException extends Exception {   NoMatchException(String s)   {     super(s);   } } class test1 {   public static void main(String args[]) throws IOException   {     BufferedReader br= new BufferedReader(new     InputStreamReader(System.in) );     System.out.println("Enter a word:");     String str= br.readLine();     try     {       if (str.compareTo("MSBTE")!=0) // can be done with equals()         throw new NoMatchException("Strings are not equal");       else         System.out.println("Strings are equal");     }     catch(NoMatchException e)     {       System.out.println(e.getMessage());     }   } }</pre>	<i>For subclass of Exception: 2M</i>  <i>Correct use of try and catch: 2M</i>  <i>Correct Logic: 2M</i>  <i>Correct syntax : 2M</i>	
(c)	<b>Write a program to display a string “concentric circles” using font “Arial” size as 12 and style as bold + italic and display three concentric circles with different colors on the applet.</b>		<i>8M</i>
Ans.	<pre>//program to display three concentric circles filled in three colors. import java.awt.*; import java.applet.*; public class myapplet extends Applet</pre>		



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		<pre> { String str=""; public void init() { Font f= new Font("Arial",Font.BOLD Font.ITALIC,12); setFont(f); } public void paint(Graphics g) { g.drawString("cocentric circles",130,100);  // for drawing three concentric circles filled with three colors. g.setColor(Color.red); g.fillOval(150,150,100,100);  g.setColor(Color.yellow); g.fillOval(160,160,80,80);  g.setColor(Color.green); g.fillOval(170,170,60,60); } } //Applet tag /*&lt;Applet code=myapplet width=200 height=200&gt; &lt;/Applet&gt; */ </pre>	<p style="text-align: right;"><i>Use of proper methods for displaying message and circles: 3M</i></p> <p style="text-align: right;"><i>correct Logic: 2M</i></p> <p style="text-align: right;"><i>Correct Syntax : 2M</i></p> <p style="text-align: right;"><i>Applet tag: 1M</i></p>
<p><b>6.</b></p>	<p><b>(a)</b>  Ans.</p>	<p><b>Attempt any FOUR of the following:</b></p> <p><b>What is the use of new operator? Is it necessary to be used whenever object of the class is created? Why?</b></p> <p><b>1) Use :</b> new operator is used to dynamically allocate memory to the object of the class. It is the operator which is used to create usable instance of the class. It is generally used along with the constructor of the class so as to get memory allocated to the object.</p> <p><b>2) It is necessary to use new operator whenever an object requires memory allocation after creation. Otherwise object in the form of reference is created which will point to Null, i.e. with no allocated space in memory.</b></p>	<p style="text-align: right;"><b>16</b> <b>4M</b></p> <p style="text-align: right;"><i>Use 2M</i></p> <p style="text-align: right;"><i>Necessity : 2M</i></p>



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	<p>(b)</p> <p>Ans.</p>	<p><b>Perform following string/ string buffer operations, write java program.</b></p> <p><b>(i) Accept a password from user</b></p> <p><b>(ii) Check if password is correct then display “Good”, else display “Wrong”</b></p> <p><b>(iii) Display the password in reverse order.</b></p> <p><b>(iv) Append password with “welcome”</b></p> <pre>import java.io.*; class passwordtest { public static void main(String args[]) { int i; BufferedReader br = new BufferedReader(new InputStreamReader(System.in)); String pass1="abc123"; String passwd="";  //Accepting password from user try { System.out.println("enter password :"); passwd=br.readLine(); } catch(Exception e) {}  // compare two passwords int n= passwd.compareTo(pass1); if(n==0) System.out.println("Good"); else System.out.println("Wrong");  //Reversing password StringBuffer s1= new StringBuffer(passwd); System.out.println("Reverse of entered password :"); System.out.println(s1.reverse());  //Append welcome to password System.out.println("Welcome appended to password :</pre>	<p><b>4M</b></p> <p><i>Correct logic and correct syntax used for each option: 1M</i></p>
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		<pre> +s1.append("Welcome")); } } </pre>	
	(c)  Ans.	<p><b>What is :</b></p> <p><b>(i) AddElement() &amp; (ii) ElementAt() command in vector</b></p> <p><b>(i) addElement() :</b> It is a method from Vector Class. It is used to add an object at the end of the Vector. <i>Syntax :</i> addElement(Object); <i>Example :</i> If v is the Vector object , v.addElement(new Integer(10)); It will add Integer object with value 10 at the end of the Vector object 'v'.</p> <p><b>(ii) elementAt() command in vector:</b> It is a Vector class method. It is used to access element or object from a specified position in a vector. <i>Syntax :</i> elementAt(index); <i>Example :</i> If v is the Vector object , v.elementAt(3); It will return element at position 3 from Vector object 'v'.</p>	<p><b>4M</b></p> <p><i>Each method :2M</i></p>
	(d)  Ans.	<p><b>What is interface? How to add interfaces to packages.</b></p> <p><b>Interface:</b></p> <ol style="list-style-type: none"> <li>1) It is similar to class but mainly used to define abstraction in Java</li> <li>2) It contains all abstract methods and final variables inside it.</li> <li>3) Interfaces have to be implemented by a class.</li> <li>4) It is mainly used to achieve multiple inheritance in Java.</li> </ol> <p><b>To add interface to packages:</b></p> <ol style="list-style-type: none"> <li>1) Begin the program with 'package &lt; package name&gt;;</li> <li>2) Declare public interface</li> <li>3) Declare final variables and abstract methods required.</li> <li>4) Save and compile the file.</li> <li>5) Create a folder with exactly same name as package name.</li> </ol>	<p><b>4M</b></p> <p><i>Interface : 1M</i></p> <p><i>Steps to add interface to</i></p>



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		<p>6) Copy class of package inside this folder.          7) Create java source code which requires interface from package          8) Import the created package inside it and use.</p> <p style="text-align: center;"><b>OR</b></p> <p><b>A) Creation of package containing interface</b>          package mypack;          public interface test          {          public int x=5;          public abstract void display();          }  <b>B) Importing package inside another java code</b>          import mypack.test;          class test1 implements test          {          public void display()          {          System.out.println("x from interface :"+x);          }          public static void main(String args[])          {          test1 t1 = new test1();          t1.display();          }          }</p>	<p><i>package OR an example may be considered : 3M</i></p>
	<p><b>(e)</b> Ans.</p>	<p><b>Write java program to display triangle filled with red colour.</b>          //program to display triangle filled with red color.          import java.awt.*;          import java.applet.*;          public class myapplet extends Applet          {          public void paint(Graphics g)          {          int x[]={ 100,150,120,100};          int y[]={ 100, 130, 150,100};          g.setColor(Color.red);          g.fillPolygon(x,y,3);          }          }</p>	<p><b>4M</b></p> <p><i>Proper use of method for triangle: 2M</i></p> <p><i>correct logic 1M</i></p> <p><i>Correct syntax</i></p>



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		<pre>/*&lt;Applet code=myapplet width=200 height=200&gt; &lt;/Applet&gt; */</pre>	<i>1M</i>
(f) Ans.	<b>Write a java program to copy contents of one file to another file.</b>	<pre>import java.io.*; class filecopy { public static void main(String args[]) throws IOException { FileInputStream in= new FileInputStream("input.txt"); //FileReader <b>class can be used</b> FileOutputStream out= new FileOutputStream("output.txt"); //FileWriter class can be used int c=0; try { while(c!=-1) { c=in.read(); out.write(c); } System.out.println("File copied to output.txt...."); } finally { if(in!=null) in.close(); if(out!=null) out.close(); } } }</pre>	<i>4M</i>  <i>Correct Logic 2M</i>  <i>Correct syntax 2M</i>