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22MCA204

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BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(An Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi)

SEMESTER END EXAMINATION QUESTION PAPER

Second Semester MCA Degree Examination

Regular / Make-up / Arrears / Supplementary

JAVA PROGRAMMING

Time: 3 hrs. **Max. Marks:** 100

*Note: 1. Answer **FIVE** full questions, choosing **ONE** full question from each module.*

Q. No	Module – 1	Marks	CO, RBT
1a.	Discuss briefly characteristic features or buzzwords of Java.	10	CO1, K2
b.	Demonstrate with a suitable example method overloading and constructor overloading.	10	CO1, K2
	OR		
2a.	Exemplify super call and super constructor. Mention the restriction of super constructor.	10	CO1, K2
b.	Exemplify three purpose of final keyword.	10	CO1, K2
	Module – 2		
3a.	How multiple inheritance achieved in JAVA? Write a program to calculate the area of a rectangle and triangle by implementing multiple inheritance.	10	CO1, K2
b.	Define package. Explain the creation of a package using a suitable example program.	10	CO1, K2
	OR		
4a.	Discuss briefly five keywords to handle exception in Java.	10	CO1, K2
b.	Develop a simple program to demonstrate ArithmeticException and ArrayIndexOutOfBounds Exception using Nested try catch statement.	10	CO1, K2
	Module – 3		
5a.	Discuss briefly about synchronization and illustrate producer consumer problem.	10	CO2, K2
b.	Exemplify enumeration? Write a Java program to create an enumeration Day of Week with seven values SUNDAY through SATURDAY, Add a method isworkday() to the DayofWeek class that returns true if the value of which it is called is MONDAY through FRIDAY, otherwise false.	10	CO2, K3
	OR		

6a.	With a neat diagram explain the life cycle of thread. Explain briefly three priority constant of thread class.	10	CO2, K2
b.	Discuss briefly about values() and valueOf() method. Demonstrate it with a suitable program.	10	CO2, K3
	Module – 4		
7a.	With a neat diagram explain servlet architecture and life cycle methods.	10	CO3, K2
b.	Write a Java Servlet program which reads two parameters from the webpage, say value1 and value2, which are of type integers, and finds the sum of the two values, and return back the result as a webpage.	10	CO3, K2
	OR		
8a.	Exemplify the following tags : i)Declaration ii)Expression iii)Scriptlet iv) Comments	10	CO3, K2
b.	Write a Java servlet program to illustrate GET and POST request. Mention any four difference between GET and POST.	10	CO3, K2
	Module – 5		
9a.	Discuss three different types of Statement objects.	10	CO4, K2
b.	Explain briefly JDBC routine process.	10	CO4, K2
	OR		
10a.	Explain any five EJB Container Service.	10	CO4, K2
b.	With a neat diagram explain the life cycle of stateful session bean.	10	CO4, K2

Course Outcomes (COs):

COs	At the end of the course, the student will be able to
CO-1	Demonstrate the basic programming constructs of Java and OOP concepts to develop Java applications.
CO-2	Illustrate the concepts of generalization and run time polymorphism to develop reusable components.
CO-3	Exemplify the usage of Multithreading in building efficient applications.
CO-4	Build web applications using Servlets and JSP.
CO-5	Design applications using JDBC and Enterprise Java Beans.
	K1- Remembering K2 - Understanding K3 – Applying K4- Analyzing K5 - Evaluating K6 -Creating

"Success is the progressive realization of a worthy goal."

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DESCRIPTIVE QUESTIONS PATTERN

COURSE CODE: 20MCA204 **COURSE NAME: JAVA PROGRAMMING**

Q. No	Scheme and Solutions	Marks
1 a)	Java Characteristic features: Simple, Object Oriented, Platform independent, Architecture Neutral, Robust, Dynamic, Secure, Interpreted and High performance, Portable, Distributed. ➔Each Characteristic feature carry 1 mark = 1 X 10 = 10 Marks	10
b)	Method overloading: Method which is having same name but the parameter list are different Class Add { void add(){} void add(int,int){} } ⇨ Explanation carries 2 Marks & Complete program carries 3 Marks ⇨ 2+3 = 5 Marks Constructor overloading: Constructor which is having same name but the parameter list are different Class Add { Add(){} Add(int,int){} } ⇨ Explanation carries 2 Marks & Complete program carries 3 Marks ⇨ 2+3 = 5 Marks ➔ 5 + 5 = 10 Marks	10
2 a)	super call: super as a reference variable used to access super class members class A{ int a; } class B extends A{ int a; void display(){System.out.println(“A : “+a); System.out.println(“Super class member A :"+a);}} ⇨ Super call explanation with program carries 4 Marks super constructor: super also used to call super class constructor class A{ int a; } class B extends A{ int b;B(int a,int b) { super(a); this.b=b;}} ⇨ Super constructor with program carries 4 Marks Restriction: super must be used only in the subclass constructor, super must be the first statement in the sub class constructor. ➔ 2 Marks ➔4+4+2 = 10 Marks	10
b)	final keyword used for three purpose: Explain with example i) To create Constant : Example :final float PI=3.142; ➔3Marks ii) To prevent method overrding : class A{ final void add(){}}➔4marks iii) To prevent inheritance : final class X{}➔3 Marks	10

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3 a) 10

we can achieve multiple inheritance using interface.

➔ explanation carries 2 Marks

```
public interface shape
{          public void area();  }
class Dimension {         private double width,height;
           Dimension(double w,double h)
           {          width=w;                    height=h;         }}
class Triangle extends Dimension implements shape {
           Triangle(double w,double h)  {          super(w,h);      }
           public void area() {                    doubleh,w;
                      h=getheight();               w=getwidth();
                      double area=0.5*w*h;
                      System.out.println(" Area of the triangle is: "+area);
           }
}
```

⇨ Complete program code carries 8 Marks

➔2+8 =10 Marks

b) 10

Package is a collection of classes and interface ➔ definition carries 2 Marks

Package creation :

Step 1: create directory say demo in some drive ex: d:\demo

Step 2: create a java source file :

```
package demo;
class A
{ void display(){System.out.println("Package demonstration");}}
Class Main{public static void main(String arg[]){ A ob=new A(); ob.display();}}
Compile : d:\demo>javac Main.java
Running: d:\>java demo.Main
```

⇨ Complete program with steps carries 8 Marks

➔2+8 =10 Marks

4 a) 10

Five keywords to handle exception : try, catch, throw, throws and finally

⇨ Each concepts explanation with code carries 2 marks = 2X5=10 Marks

b) 10

```
try{ int a[]={1,2,3}; try{ int x=a[1]/0;}catch(ArithmeticException e){
System.out.println(e);}}catch(ArrayIndexOutOfBoundsException
e){System.out.println(e);}
```

➔Complete program code carries 10 Marks

5 a) 10

Using synchronized keyword we can apply monitor to a statement or an object. ➔carries 2 Marks

```
class Queue {
           synchronized void get() { }
           synchronized void put(int n) {}
class Producer implements Runnable {
           public void run() {}      }}
class Consumer implements Runnable {
           public void run() {}      }}
classProducerConsumer {
        public static void main(String[] args) {}}
```
➔complete program carries 8 Marks

➔2+8 = 10 Marks

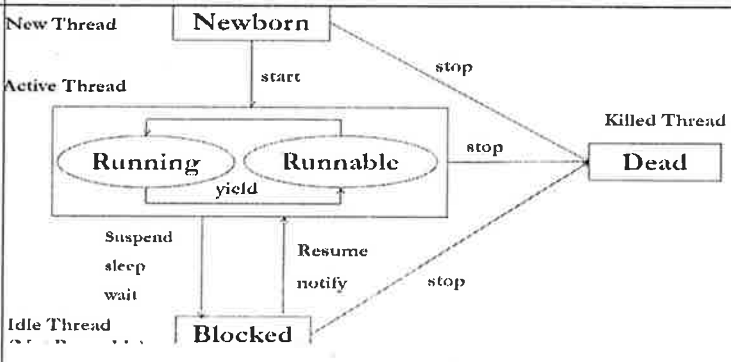
b) Enumeration is named constant, it can have constructor,methods and instant variable. ➔definition carries 02 Marks

```
enumDayOfWeek {
        SUNDAY(false),MONDAY(true),TUESDAY(true),WEDNESDAY(true),THURSDAY(true),FRIDAY(true),SATURDAY(false);

        booleanisWorkDay;

        DayOfWeek(boolean b) {
                isWorkDay=b;
        }

        booleanworkDay() {
                returnisWorkDay;
        }
}

classEnumWeek {
        public static void main(String[] args) {
                for(DayOfWeek i : DayOfWeek.values()) {
                        System.out.println(i+" is working day?   (True/False) : "+i.workDay());
                }
        }
}
```
➔ Complete program carries 8 Marks

➔2+8 = 10Marks

10

6 a)



➔Explanation with neat diagram carries 7 Marks

Thread.MAX_PRIORITY,Thread.MIN_PRIORITY,Thread.NNORMAL_PRIORITY ➔ Explanation with example carries 3 Marks

➔7+3 = 10 Marks

10

b) values() method used to fetch all the enumeration constants. valueOf() method used to fetch particular enumeration constant. ➔ Explanation carries 4 Marks

```
Apple allapples[] = Apple.values();
for(Apple a : allapples) System.out.println(a);
```

10

DESCRIPTIVE QUESTIONS PATTERN

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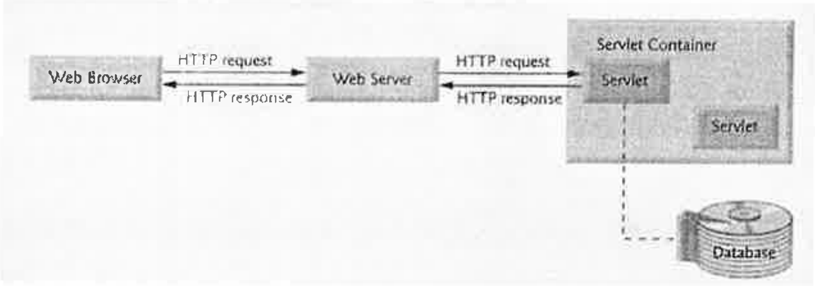
	ap = Apple.valueOf("Winesap");
	System.out.println("ap contains " + ap);
	➔Program carries 6 Marks	

7 a)	With a neat diagram explain Servlet Architecture. ➔ **4 Marks**  Web Browser HTTP request HTTP response Web Server HTTP request HTTP response Servlet Container Servlet Servlet Database and Servlet Life Cycle Methods. ➔ **6 Marks** Following are the Life Cycle Methods of Servlet i) init() ➔ One time initialization task ii) service() ➔ Each time called automatically to process client request. iii) destroy() ➔ Called only once in the life cycle of servlet.	10

b)	**a)** **Add.html**
	<form action="Add">
	Enter value for A:<input type="text" name="a"/>
	Enter value for B:<input type="text" name="b"/>
	<input type="submit" value="SUM"/></form>
	Add.java
	import java.io.*;
	import java.servlet.*;
	import java.servlet.http.*;
	public class Add extends HttpServlet
	{public void doGet() throws ServletException, IOException
	{int a=Integer.parseInt(request.getParameter("a"));
	int b=Integer.parseInt(request.getParameter("b"));
	response.setContentType("text/html");
	PrintWriter out=response.getWriter();
	out.println("Sum = "+(a+b));
	out.close();
	}} ➔ Complete code with resultant output carries **10 Marks**
		10

8 a)	**i) Declaration:**Declaration tag used to declare variable and define a method which are visible to the entire page Syntax : <%! Declaration %> Example : <%! int a=10; %> **ii)Scriptlet:** Scriptlet tags are used for writing java statement Syntax : <% Scriptlet %> Example : <% c= a+b; %> **iii) Expression:**Expression tag are used to display result output Syntax: <%= Expression %> Example : <%= result %> **v)Comments:**Comments are textual information that are not sent to client Syntax :<%-- Comment --%> <%-- This information just for developer reference --%>	10

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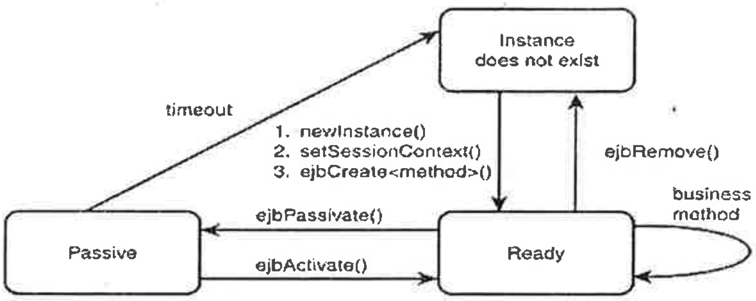
	➔each explanation, syntax and snippet code carries 2.5 Marks ➔2.5X4 = 10 Marks	
b)	**index.html** <form action="GPServlet" method="post"> <h1> Enter your Name <input type="text" name="uname"> </h1> <input type="submit" value="POST REQUEST"> </form> <form action="GPServlet" method="get"> <h1> Enter your Name <input type="text" name="uname"> </h1> <input type="submit" value="GET REQUEST"> </form> **GPServlet.java** public class GPServlet extends HttpServlet { public void processRequest(HttpServletRequest req,HttpServletResponse res) { res.setContentType("text/html"); PrintWriter out=res.getWriter(); String un=request.getParameter("uname"); out.println("<h1>Hello " +un+ " You made "+request.getMethod()+" Request</h1>");} public void doGet(HttpServletRequest req,HttpServletResponse res) { processRequest(req,res); } public void doPost(HttpServletRequest req,HttpServletResponse res) { processRequest(req,res); } } ➔ Complete code with resultant output carries **10 Marks**	10
9 a)	Statement object and its method explanation carries 3 Marks PreparedStatement object and its method explanation carries 4 Marks CallableStatement object and its method explanation carries 3 Marks ➔3+4+3=10 Maks	10
b)	JDBC routine process: Step 1: Load Driver Step 2: Connecting to DBMS Step 3: creating and executing Statement Step 4: Processing the data returned by DBMS Step 5 : Terminating the Connection with DBMS ➔Explanation with snippet code carries 10 Marks	10
10 a)	Container Service : Dependency injection, Concurrency, Instance pooling/caching, Transactions, Security, Timers, Naming and object stores, Interoperability, Lifecycle callbacks ➔ Explain any Five each carries 2 Marks = 2X5= 10 Marks	10

b)	 Instance does not exist timeout 1. newInstance() 2. setSessionContext() 3. ejbCreate<method>() ejbRemove() business method ejbPassivate() Passive Ready ejbActivate() Life Cycle of a Stateful Session Bean Diagram carries ➔ 03 Marks Explanation of 3 states i.e i)instance does not exist ii) ready and iii) Passive carries ➔ 07 Marks = 03+07 = 10 Marks	10