MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY
END SEMESTER EXAMINATION

SIST/MCA/SEM-2 /MCAC201/2022-23

JUNE – 2023

PAPER NAME: Object Oriented Programming | *PAPER CODE: MCAC201*

SEMESTER: 2

Time : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1	**Choose the correct alternatives of the following : Any *ten***	**10 x 1 = 10**			
		MARKS	CO	PO	BL

i)	Given the code fragment, what is the result?
	`public static void main(String[] args) {`
	`  StringBuilder sb = new StringBuilder(5);`
	`  String s = "";`
	`  if (sb.equals(s)) {`
	`  System.out.println("Match 1");`
	`  } else if (sb.toString().equals(s.toString())) {`
	`  System.out.println("Match 2");`
	`  } else {`
	`  System.out.println("No Match");`
	`  }`
	`}`
		1	2	2 &3	3

a.	Match 1				
b.	Match 2				
c.	No Match				
d.	A NullPointerException is thrown at runtime.				
ii)	What is the name of the Java concept that uses access modifiers to protect variables and hide them within a class?	1	1	7	1
a.	Encapsulation				
b.	Inheritance				
c.	Abstraction				
d.	Polymorphism				

iii)	**public static void** main(String[] args) {
	
	String[] planets = {"Mercury", "Venus", "Earth", "Jupiter"};
	System.***out***.println(planets. length);
	System.***out***.println(planets[1]);
	}
	What is the output?
		1	2	2 & 3	3

a.	4, Venus				
b.	24, Venus				
c.	4, Mercury				
d.	24, Mercury				

iv)	package p1;
	public class Acc {
	int p;
	private int q;
	protected int r;
	public int s;
	}
	
	Test.java:
	
	package p2;
	import p1.Acc;
	public class Test extends Acc {
	public static void main (String[] args) {
	Acc obj = new Test();
	}
	}
	
	Which statement is true for the above code?
		1	2	2 &3	3

a.	Both p and s are accessible by obj.				
b.	Only s is accessible by obj.				
c.	Both r and s are accessible by obj.				
d.	p, r, and s are accessible by obj.				

v)	Base.java;
	
	class Base {
	public void test() {
	System.***out***.println("Base");
	}
	}
	
	DerivedA.java;
	
	class DerivedA **extends** Base {
	public void test() {
	System.***out***.println("DerivedA");
	}
	}
	
	DerivedB.java;
	
	class DerivedB **extends** DerivedA {
	public void test() {
	System.***out***.println("DrivedB");
	}
	
	public static void main(String[] args) {
	Base b1 = **new** DerivedB();
	Base b2 = **new** DerivedA();
	Base b3 = **new** DerivedB();
	b1 = (Base) b3;
	Base b4 = (DerivedA) b3;
	b1.test();
	b4.test();
	}
	}
	What is the Output?
		1	2	2 &3	3

a.	Base, Derived A				
b.	Base, Derived B				
c.	Derived B, Derived B				
d.	Derived B, Derived A				
vi)	System.***out***.println("5+2="+3+4) ; System.***out***.println("5+2="+(3+4)); What will be printed in the console?	1	2	2 &3	3
a.	5+2=7 5+2=7				
b.	5+2=34 5+2=7				
c.	5+2=7 5+2=34				
d.	5+2=34 5+2=34				
vii)	Which one of the following is not a Java feature?	1	1	7	1
a.	Object-oriented				
b.	Use of pointers				
c.	Portable				
d.	Dynamic and Extensible				

viii)	What is not the use of "this" keyword in Java?	1	1	7	1
a.	Referring to the instance variable when a local variable has the same name				
b.	Passing itself to the method of the same class				
c.	Passing itself to another method				
d.	Calling another constructor in constructor chaining				
ix)	Which of these statements is incorrect about Thread?	1	1	7	1
a.	start () method is used to begin execution of the thread				
b.	run () method is used to begin execution of a thread before start () method in special cases				
c.	A thread can be formed by implementing Runnable interface only				
d.	A thread can be formed by a class that extends Thread class				
x)	Which class in Java is used to take input from the user?	1	1	7	1
a.	Scanner				
b.	Input				
c.	Applier				
d.	None of these				
xi)	Which of the following ways is the correct way to create an object in Java?	1	1	7	1
a.	Using the new keyword				
b.	clone () method				
c.	Using Scanner class				
d.	Option a and b				

GROUP – B

(Short Answer Type Questions)

Answer the following. 3 x 5 = 15

		MARKS	CO	PO	BL
2.a	State the differences for the following topics.				
	i. System.out.println(), System.out.printf(), System.out.print()	2	1	7	1
	ii. Parameterized Constructor and Non-parameterized Constructor	1	2	7	1
	iii. Single inheritance and multilevel inheritance	1	3	7	1
	iv. Method Overloading and Method Overriding	1	3	7	1
	OR				
2.b.	i. Write the uses of the following: join(), isAlive(), notify()	3	6	7	1

	ii. Explain the different Looping Statements in Java	2	6	7	1

3.a.	i. Is the following code legal? If yes, mention the reason.
	try {
	...
	} finally {
	...
	}
		2	5	1 & 7	1

	ii. Can we have the try block without catch block? If yes, mention the reason.	2	5	1 & 7	1
	iii. State one difference between throw and throws with respect to Exception Handling.	1	5	1 & 7	1
	OR				

3.b.	i. Compute the output:
	1. class Base {
	2. public static void show() {
	3. System.out.println("Base::show() called");
	4. }
	5. }
	6. class Derived extends Base {
	7. public static void show() {
	8. System.out.println("Derived::show() called");
	9. }
	10. }
	11. class Main {
	12. public static void main(String[] args) {
	13. Base b = new Derived();
	14. b.show();
	15. }
	16. }
		2	2	2 &3	3

	ii. Explain the following: Encapsulation, Abstraction, multithreading	3	6	1 & 7	1

4.a.	For the following code, compute the output and explain the use of "super" keyword.
	
	class A {
	void e ( )
	{ System.out.println("Java...");
	}
	}
	
	class D extends A {
	void e () {
	System.out.println("Programming...");}
	void b () {
	work System.out.println("class...");}
	void w () {
	super.e();
	b ();
	}
	}
	class B{
	public static void main (String args[]){
	D d=new D ();
	d.work ();
	}
	}
		3 +2	2	2 &3	3

	OR				

4.b.	i. Consider the following class:
	public class Example1 {
	public static int x = 7;
	public int y = 3;
	}
	How many class variables does the Example contain? What are their names?
	How many instance variables does the Example contain? What are their names?
		2	**2**	2 &3	3

	ii. State the difference between "final" and "finally" keyword. Illustrate with an example.	**3**	**3**	**1 & 7**	1
	GROUP – C				
	(Long Answer Type Questions)				
Answer the following.		**3 x 15 = 45**			
5.a.		MARKS	CO	PO	BL
i.	Explain the following terms with respect to exception handling. i) try ii) catch iii) throw iv) finally	4	5	7	1
ii.	What is a thread? Describe the complete life cycle of thread.	4	6	7	1
iii.	What is garbage collection in java?	1	5	7	1
iv.	Explain how you will reverse a number in JAVA: (Sample i/p: 12345 o/p: 54321) a. Using loop b. Using recursion	6	2	2 &3	3
	OR				
5.b.					
i	Demonstrate private and protected access modifiers in JAVA with some example code.	4	2	2 &3	3

ii.	Design a Box class with parameterized constructor with an object argument to initialize length, breadth and height. Create a function volume which returns the volume of the box and print it in main method.	4	2	2 &3	3
iii.	What is difference between system.in and system.out in Java?	2	1	7	1
iv.	What is the difference between a thread and a process?	2	6	7	1
v.	What is a package? How to define it and access it? Explain with an example.	1+2	6	7	1
6.a.					
i.	Demonstrate constructor overloading concept.	2	2	7	1
ii.	Differentiate between error and exception.	3	5	7	1
iii.	State the benefits of inheritance. Explain the various forms of inheritance with suitable code segments.	6	3	1 & 7	3
iv.	Compare Method Overriding and Method Overloading with an example	4	3	1 & 7	1
6.b.	OR				
i.	Differentiate class, abstract class, and interface.	3	1	7	1
ii.	Demonstrate Nested try statements with an example.	3	5	1 & 7	1
iii.	Demonstrate in a Java program to implement multilevel inheritance concept.	3	3	1 & 7	1
iv.	Differences between exceptions, errors, and runtime exceptions.	3	5	7	1
v.	Explain how to check whether the given number is a palindrome in JAVA.	3	2	2 &3	3

7.a	Read the given scenario and implement it in JAVA: a. Define two different classes namely, Student and Employee. b. These classes are derived from a base class School Population. c. Define other two classes Staff and Teacher. d. Staff and Teacher classes are derived from Employee class. e. The School Population class has name and age data and display method to display the name and age of a person. f. The Student class has data like roll number/ id and class enrolled and display method to print the data such as name, age, roll number/ id and class enrolled of the student. g. Staff has employee id and date of joining data and display method to display name, age, employee id, date of joining of the staff. h. Teacher has designation (Junior Class Teacher (Class 1 to 5) and Senior Class Teacher (Class 6 to 10) and display method to display the name, age, employee id, date of joining and designation of the faculty. i. Each class should have their own constructor instantiated. Implement the above classes and subclasses using the concepts of: a. Inheritance b. interface, and c. abstract methods in JAVA.	15	2	2 &3	3
	OR				
7.b.i	Define data abstraction.	1	1	7	1
ii.	What is a constructor? What is its requirement in programming? Explain with example.	1 + 3	2	1 & 7	3
iii.	What is the significance of Java's byte code?	1	1	7	1
iv.	Discuss various loop statements and branching statements available in Java. Explain with code snippets.	3	1	1 & 7	3
v.	Describe the uses of final and super keywords with respect to inheritance.	3	3	7	1
vi.	What are the drawbacks of procedural languages? Explain the need for object-oriented programming with suitable examples.	3	1	1 & 7	1