

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-IV EXAMINATION – WINTER 2025

Subject Code:3140705

Date:28-11-2025

Subject Name:Object Oriented Programming -I

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) (i) What happens when your program attempts to access an array element with an invalid index? **03**
(ii) What are the benefits of data field encapsulation?
(iii) What is the registration method for a button to register an Action Event handler?
- (b) Differentiate following: **04**
(i) abstract class with interface
(ii) String with String Buffer
- (c) Write a method that returns a new array by eliminating the duplicate values in the array using the following method header: public static int[] eliminate Duplicates(int[] list). Write a test program that reads in ten integers, invokes the method, and displays the result. **07**
- Q.2** (a) Compare static methods with instance methods. **03**
(b) How do you create a button with a text and a node? How do you set a handler for processing a button-clicked action? **04**
(c) What is exception? Explain the use of exception handling keywords with example. **07**
- OR**
- (c) How do interfaces support polymorphism? Explain with example. **07**
- Q.3** (a) What is polymorphism? What is dynamic binding? **03**
(b) Explain the use of File class to handle I/O. **04**
(c) Write the bin2Dec(String binary String) method to convert a binary string into a decimal number. Implement the bin2Dec method to throw a Number Format Exception if the string is not a binary string. **07**
- OR**
- Q.3** (a) How do you prevent a class from being extended? How do you prevent a method from being overridden? **03**
(b) Differentiate the followings: **04**
(i) Checked and Unchecked Exceptions
(ii) Text I/O and Binary I/O
(c) Write a program that lets users copy files. The user needs to provide a source file and a target file as command-line arguments using the command: java Copy source target **07**

- Q.4** (a) Define the compare To method in a class implementing the Comparable interface. What are the benefits of implementing the Comparable interface? **03**
(b) What do you understand by thread? Describe the complete life cycle of thread. **04**
(c) Describe and compare Hash Map, Linked Hash Map, and Tree Map. **07**

OR

- Q.4** (a) What is a recursive method? Write a recursive mathematical definition for computing 2^n for a positive integer n. **03**
(b) What do you mean by thread synchronization? How can you synchronize java threads? **04**
(c) Write a program to add ten elements in a list and traverse a list in both directions. **07**

- Q.5** (a) What are the benefits of using generic types? How do you declare a generic type in a class? **03**
(b) Which method do you use to obtain an element in the collection from an iterator? Explain with example. **04**
(c) Which layout panes are supported by JavaFX? Write a program to create a login screen using Grid Pane. **07**

OR

- Q.5** (a) How do you declare and invoke a generic method? **03**
(b) How do create and use anonymous inner class? **04**
(c) Write a program to define and register handlers for key pressed, key released, and key typed events using JavaFX. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2024****Subject Code:3140705****Date:30-11-2024****Subject Name:Object Oriented Programming -I****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Why public, static, void and arguments in following statement required → public static void main(String args[])	03
	(b) List out different types of loops available in java with code snippet.	04
	(c) Describe Inheritance, Polymorphism and Data Encapsulation characteristics of OOP with example.	07
Q.2	(a) State three use of final keyword.	03
	(b) Describe java Access modifier.	04
	(c) Define concept of method overloading and method overriding with examples.	07
OR		
	(c) What is Abstract class? Describe usage of Abstract class with one example.	07
Q.3	(a) Describe use of Super keyword.	03
	(b) Describe various methods and usage of Object class in java.	04
	(c) Create a class called Employee that includes three pieces of information as instance variables—a first name (typeString), a last name (typeString) and a monthly salary (double). Your class should have a constructor that initializes the three instance variables. Provide a set and a get method for each instance variable. If the monthly salary is not positive, set it to 0.0. Write a test application named EmployeeTest that demonstrates class Employee's capabilities. Create two Employee objects and display each object's yearly salary. Then give each Employee a 10% raise and display each Employee's yearly salary again.	07
OR		
Q.3	(a) Describe use of static keyword.	03
	(b) Define property of Dynamic method dispatch with example.	04
	(c) Create a class named Account with instance variables Ac_No,Name and Balance and methods display (), setdata (),deposit(). In display () method, display the instance variables value Ac_No,Name and Balance). And in setdata () method set the instance variable values (Ac_No,Name and Balance) and in deposit() method the amount that user wants to deposit that will be deposited.	07
Q.4	(a) Write a Java program to copy one array list into another.	03
	(b) Read two numbers from command line argument and print sum of them.	04
	(c) Describe steps to create a package with one example.	07

OR

- Q.4** (a) Describe following keywords: (i) throw (ii) throws **03**
(b) Compare Abstract class and Interface **04**
(c) Create a method named Withdraw () in the main function performing exception handling. Example: Balance = 1000; Withdraw = 12000 Here, Balance<Withdraw (throw exception) **07**

- Q.5** (a) Describe following term : finally and finalize **03**
(b) Write a java program to read employee details from emp.txt file and print on screen. **04**
(c) Create customer class which extends thread class and contains two instance variables name, ProductName and static variable Product Quantity. For example if two customers are trying to buy the same product at once then follow synchronization of two customers extending thread class. **07**

OR

- Q.5** (a) Describe any one wrapper class with its method usage. **03**
(b) Write a java program to read students details from console and write that students details into emp.txt file. **04**
(c) Write a program to create GUI for Student registration form using JavaFX. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2023****Subject Code:3140705****Date:31-01-2024****Subject Name: Object Oriented Programming -I****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
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		MARKS
Q.1	(a) How java supports platform independency? What is the role of JVM in it?	03
	(b) Write a program which displays first n prime number? Where is n provided by user as command line argument?	04
	(c) Write a program which declare integer array of 10 elements? Initialize array and define following methods with the specified header:	07
	(i) public static int add(int [] array) print addition of all element of array. (ii) public static int max(int [] array) print maximum element of array. (ii) public static int search(int [] array, int key) search element key in array and return index of it. If element is not found method will return -1.	
Q.2	(a) Describe the relationship between an object and its defining class?	03
	(b) Analyze following code. Validate and explain output of code. If any error exists, indicate portion. Suggest code to eliminate error:	04
	<pre> public class Circle { private double radius; public static void main(String args[]){ Circle c1=new Circle(2); System.out.println("Area "+c1.getArea()); B b1=new B(2, 2); System.out.println("Area "+b1.getArea()); } public Circle(double radius) { radius = radius; } public double getRadius() { return radius; } public double getArea() { return radius * radius * Math.PI; } } class B extends Circle { private double length; B(){} B(double radius, double length) { length = length; } public double getArea() { return (super.getArea() * length); } } </pre>	
(c)	Design a java class Rectangle which contains following field and methods:	07
	(i) Field: length, width: int	
	(ii) Default Constructor: initialize all fields with 0 value	
	(iii) Method: int getArea() will return area of rectangle.	

OR

- (c) Answer in brief(within two lines): **07**
- (i) If a method defined in a subclass has the same signature as a method in its superclass with the same return type, is the method overridden or overloaded?
 - (ii) How do you invoke an overridden superclass method from a subclass?
 - (iii) What is the purpose of "this" keyword?
 - (iv) Differentiate between following statements:
int a=3;
Integer b=new Integer(3);
 - (v) Which java keyword is used to prevent inheritance (prevent class to be extended)?
 - (vi) Can we create reference of interface. If we can create, then what is the use of it?
 - (vii) What is the difference between a String in Java and String in C/C++?

- Q.3** (a) Discuss benefits of multithreading? **03**
- (b) Develop a program which stores name of districts in Gujrat in array of String. The array specified capacity to store 5 districts. The user will be able to print name of district based on array index e.g. (0 will print Ahemdabad). If the specified index is out of bounds, program will display the message Out of Bounds. **04**
- (c) Characterize the two ways of implementing thread in Java? Illustrate each method by example? **07**

OR

- Q.3** (a) Explain the use of finally. Show the type of code usually kept in finally? **03**
- (b) Distinguish unchecked exception and checked exception? Give example of each type of exception? **04**
- (c) Implement java code to take some (say 10) Strings from users. Put all the input Strings in an array (String name[]). Provide implementation of following methods: **07**
- (i)search(String s) will return index of String passed in method if String S is found in name, otherwise return -1.
 - (ii)sort() will print sorted String array to user

- Q.4** (a) Write a program to find out whether the given number is palindrome or not? **03**
- (b) Outline the use of throw in exception handling with example. **04**
- (c) Give Definitions: static, finalize, final **07**

OR

- Q.4** (a) Elaborate the role of java garbage collector. **03**
- (b) State four similarities between Interfaces and Classes. **04**
- (c) Differentiate between ArrayList and LinkedList? Which list should you use to insert and delete elements at the beginning of a list? What methods are in LinkedList but not in ArrayList? **07**

- Q.5** (a) List various classes for Binary Input Output? **03**
- (b) Characterize the role of *Iterator* interface? **04**
- (c) Explain *DataInputStream* and *DataOutputStream* Classes? Implement a java program to demonstrate any one of them? **07**

OR

- Q.5** (a) What do you understand by JavaFX? How it is different from AWT? **03**
- (b) Explain ArrayList Class with its methods? **04**
- (c) Design and develop EMI Calculator using JavaFX? The user will enter a loan amount, annual interest **07**

rate, and number of years and click the Calculate button to get EMI and total payment ? formula is

$$EMI = P * r * (1+r)^n / ((1+r)^n - 1)$$

P is Principal Loan Amount

r is rate of interest calculated on monthly basis. (i.e., r = Rate of Annual interest/12/100. If rate of interest is 10.5% per annum, then r = 10.5/12/100=0.00875)

n is loan term / tenure / duration in number of months?

Input	Value
Annual Interest Rate:	4.5
Number of Years:	4
Loan Amount:	5000
Monthly Payment:	\$114.02
Total Payment:	\$5472.84

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1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) Discuss significance of byte code.	03
(b) Explain Java garbage collection mechanism.	04
(c) List OOP characteristics and describe inheritance with examples.	07
Q.2 (a) Explain constructor with the help of an example.	03
(b) List out different methods available for String class in java and explain any two with proper example.	04
(c) Explain all access modifiers and their visibility as class members.	07
OR	
(c) Compare String with StringBuffer. Also, write a program to count the occurrence of a character in a string.	07
Q.3 (a) What is the final class? Why they are used?	03
(b) Write exception handling mechanisms in JAVA.	04
(c) Explain Overloading and Overriding with example.	07
OR	
Q.3 (a) How can you create packages in Java?	03
(b) What is Inheritance? List out the different forms of Inheritance and explain any one with example.	04
(c) Explain the words super, static, final and this with the help of an example.	07
Q.4 (a) List out various layout panes in JavaFX.	03
(b) Explain the architecture of JavaFX.	04
(c) Discuss BufferedInputStream and BufferedOutputStream classes with an example.	07
OR	
Q.4 (a) List out JavaFX UI controls and explain any one in detail.	03
(b) Demonstrate animation effect in JavaFX.	04
(c) Create a class called Student. Write a student manager program to manipulate the student information from files by using FileInputStream and FileOutputStream.	07
Q.5 (a) What is Java Collection?	03
(b) List out methods of Iterator and explain it.	04
(c) Explain Set and Map in Java with example.	07
OR	
Q.5 (a) What is Vector class?	03
(b) Describe with diagram the life cycle of Thread.	04
(c) Explain synchronization in Thread with suitable example.	07
