Feb-March-May 2024
Study Plan

First Day Date:25.10.2024

Theory Questions

1. **What is Object-Oriented Programming, and why is it important?**
2. **Explain the four principles of OOP: Encapsulation, Abstraction, Inheritance, and Polymorphism.**
3. **What is the difference between a class and an object?**
4. **What is encapsulation, and how is it implemented in Java?**
5. **What is inheritance? How does it work in Java?**

Mcq

Object-Oriented Programming (OOP) Concepts

1. What is the main purpose of encapsulation in OOP?

- **A) To increase performance**
- **B) To hide the internal workings of an object**
- **C) To allow method overloading**
- **D) To implement inheritance**

2. Which OOP principle promotes code reuse?

- **A) Abstraction**
- **B) Inheritance**
- **C) Encapsulation**
- **D) Polymorphism**

3. What is polymorphism in Java?

- **A) Creating multiple objects from one class**
- **B) Using multiple constructors in a class**
- **C) Ability of a variable or method to take multiple forms**
- **D) Hiding details of a class implementation**

Programs

Q1. Write a program to print the area of two rectangles having sides (4,5) and (5,8) respectively by creating a class named 'Rectangle' with a method named 'Area' which returns the area and length and breadth passed as parameters to its constructor.

Q2. Write a Java program to create a class called "Circle" with a radius attribute. You can access and modify this attribute. Calculate the area and circumference of the circle.

Q3. Write a Java program to create a class called "Employee" with a name, job title, and salary attributes, and methods to calculate and update salary.

Sql Quries

select *from Books;

```
+--------+-----------------------+--------------------+-----------+--------------+-----------------+
| BookID | Title                 | Author             | Genre     | PublishedYear | CopiesAvailable |
+--------+-----------------------+--------------------+-----------+--------------+-----------------+
|      1 | The Great Gatsby      | F. Scott Fitzgerald | Classic   |         1925 |               5 |
|      2 | 1984                  | George Orwell      | Dystopian |         1949 |               2 |
|      3 | To Kill a Mockingbird | Harper Lee         | Classic   |         1960 |               4 |
|      4 | The Catcher in the Rye | J.D. Salinger      | Classic   |         1951 |               3 |
|      5 | Brave New World       | Aldous Huxley      | Dystopian |         1932 |               6 |
+--------+-----------------------+--------------------+-----------+--------------+-----------------+
```

5 rows in set (0.00 sec)

select *from members;

```
+----------+--------------+----------------+--------------------+-------------+
| MemberID | Name         | MembershipDate | Email              | BooksIssued |
+----------+--------------+----------------+--------------------+-------------+
|        1 | Alice Johnson | 2022-05-20     | alice@example.com  |           1 |
|        2 | Bob Smith     | 2021-03-15     | bob@example.com    |           2 |
|        3 | Charlie Brown | 2023-01-10     | charlie@example.com |           0 |
|        4 | David Wilson  | 2022-11-25     | david@example.com  |           1 |
|        5 | Emily Davis   | 2021-08-19     | emily@example.com  |           3 |
```

Perform Quries 15 on Above Tables.

Note:- above quries are solve 25 oct to 30 oct 2024 all quries we solve 3 quries per day 3 X 5 = 15

1. Retrieve all books with more than 3 copies available:
2. List all members who have issued more than 2 books:
3. Find books published before the year 1950:

Second Day Date:26.10.2024

Theory Questions

1. **What are the types of inheritance supported by Java?**
2. **What is polymorphism, and what are the two types of polymorphism in Java?**
3. **What is method overloading? Provide an example.**
4. **What is method overriding, and how is it used in Java?**
5. **Explain the difference between this and super keywords.**

Mcq

4. Which of the following is used to define an abstract class?

- **A) abstract class ClassName { }**
- **B) class AbstractClass { }**
- **C) void abstract()**
- **D) public static class**

5. What does the this keyword refer to in Java?

- **A) The current method**
- **B) The current object**
- **C) The current class**
- **D) The superclass**

6. Which of the following is NOT an OOP principle?

- **A) Inheritance**
- **B) Encapsulation**
- **C) Compilation**
- **D) Polymorphism**

Programs

1.Write a java program to create program for constructor overloading with class name as ArrayCons

ArrayCons (int a []): this function is used for accept array as parameter and

ArrayCons(int a[] , int b[]): this function will accept array as parameter and check array is anagram or not.

Q 2. Write a java program to create a constructor name as StringApp to accept charchater array and implement the logic.

Input : - Indian
Search Value : - d

Output : - n i

Sql Quries

1. Update the CopiesAvailable for a specific book by decreasing it by 1:
2. Delete a book by its title:
3. List all books in alphabetical order by title:

Third Day Date:27.10.2024

Theory Questions

1. **What is an array, and how does it work in Java?**
2. **Explain the difference between a single-dimensional and a multi-dimensional array.**
3. **How do you declare and initialize an array in Java?**
4. **What are the advantages and disadvantages of using arrays?**
5. **How can you find the length of an array in Java?**

Mcq

7. Which keyword is used to inherit a class in Java?

- **A) inherits**
- **B) extends**
- **C) implements**
- **D) super**

8. What is method overriding?

- **A) Using the same method name with different parameters**
- **B) Defining a method in a subclass with the same signature as in the superclass**
- **C) Calling multiple methods with the same name**
- **D) Having methods with the same name in different classes**

9. In which of the following situations would you use an interface in Java?

- **A) When you need multiple inheritance**
- **B) When you need to store only primitive data types**
- **C) When creating a final class**
- **D) When you want a method to have private access**

Programs

Q1. WAP to print the fibonacii series using array

Q2. WAP to create the Jagged array array and print the follwing matrix in java

1 2 3
4 5
7 8 9 19

Sql Quries

1. Count the total number of members in the Members table:
2. Get the details of the most recent member who joined:
3. Retrieve books of the genre 'Classic':

Forth Day Date:28.10.2024

Theory Questions

1. **What is an abstract class, and when would you use it?**
2. **How do interfaces work in Java, and how do they differ from abstract classes?**
3. **What is a constructor, and what are the rules for defining constructors?**
4. **What is the purpose of the final keyword? Give examples of its use with classes, methods, and variables.**
5. **What is the difference between composition and inheritance?**

Mcq

10. Which access modifier makes a class or method accessible from any other class?

- **A) protected**
- **B) default**
- **C) public**
- **D) private**

11. What is an array?

- **A) A collection of methods**
- **B) A single variable that can hold multiple values of the same type**
- **C) A data structure for storing text data**
- **D) A variable that can hold multiple types of values**

12. Which statement correctly creates an array of integers?

- **A) int arr[5];**
- **B) int[] arr = new int[5];**
- **C) int arr = [5];**
- **D) int arr(5);**

Programs

Q1. WAP to find the occurence of array

Q2. WAP to input the string and check string is anagram or not using java

Sql Quries

1. Show the total number of books issued by each member:
2. List all books with '1984' in the title:
3. Display all books along with their availability status (In Stock or Out of Stock):

Fifth Day Date:29.10.2024

Theory Questions

1. **Can you explain the instanceof keyword with an example?**
2. **What is a static variable or method? How does it differ from instance variables or methods?**
3. **What is an inner class, and why would you use one?**
4. **What is the significance of access modifiers in OOP?**
5. **What are anonymous classes, and how are they used?**

Mcq

13. What is the index of the first element in an array in Java?

- **A) 0**
- **B) 1**
- **C) -1**
- **D) Depends on the array type**

14. Which of the following exceptions is thrown when accessing an array out of bounds?

- **A) ArrayException**
- **B) ArrayIndexOutOfBoundsException**
- **C) NullPointerException**
- **D) IllegalStateException**

15. What is the length of the array int[] arr = {1, 2, 3, 4, 5};?

- **A) 4**
- **B) 5**
- **C) 6**
- **D) 1**

Programs

Q1. WAP to find the probability of string

abc
acb
cba
bca

Q2. WAP to create the String and find the duplicated words in string

---

Sql Quries

1. Update the email of a specific member:
2. Show members who joined in the last year:

Sixth Day Date:30.10.2024

Theory Questions

21. **What is an ArrayIndexOutOfBoundsException, and when does it occur?**
22. **Explain the difference between an array and an ArrayList in Java.**
23. **How do you iterate over elements of an array in Java?**
24. **How can you copy elements from one array to another?**
25. **What is a jagged array, and how does it differ from a multi-dimensional array?**

Mcq

16. Which method can be used to get the length of an array?

- **A) length()**
- **B) size()**
- **C) count()**
- **D) length**

17. How do you access the last element of an array in Java?

- **A) arr[arr.length]**
- **B) arr[arr.length - 1]**
- **C) arr[-1]**
- **D) arr.last()**

18. Which of the following is used to store multi-dimensional data?

- **A) Jagged array**
- **B) Single-dimensional array**
- **C) Multi-dimensional array**
- **D) Two arrays combined**

Programs

Q1. ArithmeticException

Q2. ArrayIndexOutOfBoundsException

Q3. NumberFormatException

Q4. InputMismatchException

Q5. NullPointerException

Sql Quries

```
select *from courses;
+----------+-------------------+--------------+---------+
| CourseID | CourseName        | Instructor   | Credits |
+----------+-------------------+--------------+---------+
```

```
|     101 | Mathematics          | Dr. Roberts |      4 |
|     102 | Science              | Dr. Lewis   |      3 |
|     103 | History              | Dr. Williams |     2 |
|     104 | English              | Dr. Brown   |      3 |
|     105 | Physical Education | Coach Lee   |      1 |
+----------+--------------------+-------------+---------+
select *from enrollments;
+--------------+-----------+----------+----------------+-------+
| EnrollmentID | StudentID | CourseID | EnrollmentDate | Grade |
+--------------+-----------+----------+----------------+-------+
|            1 |         1 |      101 | 2024-01-10     | A     |
|            2 |         1 |      102 | 2024-02-15     | B     |
|            3 |         2 |      101 | 2024-03-12     | A     |
|            4 |         3 |      103 | 2024-01-10     | C     |
|            5 |         4 |      104 | 2024-04-01     | B     |
|            6 |         5 |      105 | 2024-01-22     | A     |
+--------------+-----------+----------+----------------+-------+
6 rows in set (0.00 sec)

mysql> select *from students;;
+-----------+---------------+------+------------+
| StudentID | Name          | Age  | GradeLevel |
+-----------+---------------+------+------------+
|         1 | Alice Johnson |   14 | 9th        |
|         2 | Bob Smith     |   15 | 10th       |
|         3 | Charlie Brown |   13 | 8th        |
|         4 | David Wilson  |   14 | 9th        |
|         5 | Emily Davis   |   15 | 10th       |
+-----------+---------------+------+------------+
5 rows in set (0.00 sec)
```

Perform Quries 15 on Above Tables.

Note:- above quries are solve 30 oct to 4 nov 2024 all quries we solve 3 quries per day 3 X 5 = 15

1. Retrieve all students enrolled in each course, along with the instructor's name:
2. Find students who are taking 'Mathematics' and their respective grades:
3. List the names of all students, their courses, and the enrollment date for each course:

Seventh Day Date:31.10.2024

Theory Questions

1. **What are loops in Java, and why are they useful?**
2. **Explain the for loop with an example.**
3. **Explain the while loop and when it should be used over a for loop.**
4. **What is the difference between while and do-while loops?**
5. **Explain the use of the break statement in loops with an example.**

Mcq

19. What is a jagged array?

- **A) An array with no elements**
- **B) An array where each row can have a different number of columns**
- **C) An array where each element has the same size**
- **D) An array of strings**

20. How can you sort an array in Java?

- **A) sortArray()**
- **B) Arrays.sort(arr);**
- **C) Array.sort()**
- **D) arr.sort()**

21. What does a for loop generally consist of?

- **A) Initialization, condition, update**
- **B) Declaration, condition, update**
- **C) Condition, initialization, increment**
- **D) Initialization, declaration, termination**

Programs

Q1. WAP to create the abstract class name as StringParent with abstract method
void acceptString(String str): this function can accept the string value
and we have the some child classes
ConvertToUpper we have to override StringParent in ConvertToUpper
and convert lower case string to upper case without using inbuilt function

Q2. WAP to create the interface name as StringInterface with a method name as
void acceptString(String): this function accept the string
and create the one child class name as SortString and implement the interface in it
and sort the string without using any inbuilt function

Sql Quries

1. Show the average age of students enrolled in each course:
2. Find courses that no students are enrolled in:
3. List all students who have received an 'A' grade in any course:

Eigthth Day Date:02.10.2024

Theory Questions

1. **How does the continue statement work in loops?**
2. **What is an enhanced for-each loop, and how is it different from a traditional for loop?**
3. **Explain how you can create an infinite loop in Java.**
4. **What are nested loops, and when are they useful?**
5. **How can you exit from nested loops?**

Mcq

22. Which of these loops guarantees execution at least once?

- **A) for**
- **B) while**
- **C) do-while**
- **D) if**

23. What is the purpose of the break statement in a loop?

- **A) To continue to the next iteration**
- **B) To end the program**
- **C) To stop the loop immediately**
- **D) To skip one loop cycle**

24. What keyword would you use to skip the current iteration and move to the next in a loop?

- **A) exit**
- **B) break**
- **C) continue**
- **D) skip**

Programs

Sql Quries

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1. Find all students along with their courses and the number of credits for each course:
2. Count the total number of students enrolled in each course:
3. List students along with all the courses they are not enrolled in:

Ninth Day Date:03.10.2024

Theory Questions

1. **What is file handling, and why is it important in Java?**
2. **What are the main classes used for file handling in Java?**
3. **Explain the purpose of the File class in Java.**
4. **How do you create a new file in Java?**
5. **How do you write data to a file in Java?**

Mcq

25. How many times will the following code execute? for (int i = 0; i < 5; i++) { }

- **A) 6**
- **B) 5**
- **C) 4**
- **D) 1**

File Handling

26. What does the File class represent in Java?

- **A) Only a file on the disk**
- **B) Both a file and a directory path**
- **C) Only a directory**
- **D) Network file**

27. Which class is used to write data to a file?

- **A) FileWriter**
- **B) FileReader**
- **C) BufferedReader**
- **D) Scanner**

28. Which method checks if a file exists?

- **A) exists()**
- **B) isPresent()**
- **C) existsFile()**
- **D) isFile()**

29. What is serialization in Java?

- **A) Saving objects to a database**
- **B) Writing an object's state to a byte stream**
- **C) Reading a file**

- **D) Deleting an object**

Programs

WAP program to read the file and perform following operation on it

1) count the number of line in file

2) count the number of character from file file

3) count the number of words from file

4) count the number of owels and consonent from file

5) count the number of spaces in file

Sql Quries

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1. Display students along with courses and grades for courses taught by 'Dr. Roberts'
2. Find the most recent enrollment for each student:
3. List students enrolled in more than one course:

Ten Day Date:04.10.2024

Theory Questions

1. **How do you read data from a file in Java?**
2. **What is the FileReader and FileWriter class used for?**
3. **What are the differences between FileInputStream and FileOutputStream?**
4. **Explain the use of BufferedReader and BufferedWriter.**
5. **What is serialization, and why is it used in Java?**

Mcq

30. Which class is used for buffered file reading in Java?

- **A) File**
- **B) FileWriter**
- **C) BufferedReader**
- **D) FileReader**

_____

String Handling

31. What is a string pool?

- **A) A collection of string arrays**
- **B) A pool of string objects in memory**
- **C) A pool where strings are dynamically created**
- **D) A list of all immutable objects**

32. Which method compares two strings in a case-sensitive manner?

- **A) compareTo()**
- **B) equals()**
- **C) compare()**
- **D) equal()**

Programs

1. **Reverse a String Using StringBuffer**
2. **Append and Insert Text in StringBuilder**
3. **Delete a Substring from StringBuffer**
4. **Replace a Word in StringBuilder**
5. **Check Palindrome Using StringBuilder**
6. **Calculate Capacity of StringBuffer**
7. **Convert StringBuffer to Uppercase**
8. **Generate a Substring Using StringBuilder**
9. **Insert a Character Array in StringBuffer**
10. **Clear Content of StringBuilder**

Sql Quries

1. Get the details of students who are not taking 'Science':
2. List students, courses, and instructor names where the student's grade level is '10th'
3. Display the total credits earned by each student based on their course enrollments:

Remaining SQL Tasks

```
mysql> select *from customers;
+------------+---------------+--------------------+-------------+
| CustomerID | Name          | Email              | City        |
+------------+---------------+--------------------+-------------+
|          1 | Alice Johnson | alice@example.com  | New York    |
|          2 | Bob Smith     | bob@example.com    | Los Angeles |
|          3 | Charlie Brown | charlie@example.com | Chicago    |
|          4 | David Wilson  | david@example.com  | Miami       |
|          5 | Emily Davis   | emily@example.com  | Dallas      |
+------------+---------------+--------------------+-------------+
5 rows in set (0.00 sec)
mysql> select *from orders ;
+---------+------------+-----------+------------+----------+
| OrderID | CustomerID | ProductID | OrderDate  | Quantity |
+---------+------------+-----------+------------+----------+
|       1 |          1 |       101 | 2024-01-10 |        1 |
|       2 |          2 |       102 | 2024-02-15 |        2 |
|       3 |          3 |       103 | 2024-03-12 |        1 |
|       4 |          4 |       104 | 2024-04-01 |        3 |
|       5 |          5 |       105 | 2024-01-22 |        1 |
+---------+------------+-----------+------------+----------+
5 rows in set (0.00 sec)
mysql> select *from products ;
+-----------+-------------+-------------+--------+
| ProductID | ProductName | Category    | Price  |
+-----------+-------------+-------------+--------+
|       101 | Laptop      | Electronics | 800.00 |
|       102 | Smartphone  | Electronics | 500.00 |
|       103 | Tablet      | Electronics | 300.00 |
|       104 | Headphones  | Accessories |  50.00 |
|       105 | Camera      | Electronics | 600.00 |
+-----------+-------------+-------------+--------+
```

Solve Below Quries

1. **Find customers who have ordered a product with a price greater than $500:**

2. **Retrieve the name of the product with the highest price:**
3. **List all orders where the order quantity is higher than the average quantity across all orders:**
4. **Find customers who have not placed any orders:**
5. **List products that belong to the same category as 'Laptop':**
6. **Get the customer names along with their email for those who placed an order for the product 'Camera':**
7. **Display the details of the most recent order:**
8. **Find the products that cost less than the average price of all products:**
9. **Retrieve customers who are from the same city as 'Alice Johnson':**
10. **List the names of products that have been ordered by 'Bob Smith':**
11. **Find the total quantity ordered for each product, listing only products with quantities greater than the average quantity ordered across all products.**
12. **Get the names of customers who have ordered all products in the 'Electronics' category:**
13. **Display the names of all customers who placed an order on '2024-01-10':**
14. **List all cities where customers have placed orders for products priced above $400:**
15. **Find products ordered by customers who are based in 'Los Angeles':**