Reg. No. : | | | | | | | | | | | | |

**Question Paper Code : 70436**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Third / Fourth / Fifth Semester

Computer Science and Engineering

CS 8392 — OBJECT ORIENTED PROGRAMMING

(Common to : Computer and Communication Engineering / Electrical and Electronics Engineering / Electronics and Communication Engineering / Electronics and Instrumentation Engineering / Electronics and Telecommunication Engineering / Instrumentation and Control Engineering / Artificial Intelligence and Data Science / Computer Science and Business Systems / Information Technology)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How does Java achieve portability and platform neutrality?
2. What is the importance of static keyword?
3. How do Interfaces differ from Abstract classes?
4. What is deep object cloning? How it is implemented in Java.
5. What will the output of the following Java code?

```
class test {
    public static void main(String args[ ]) {
        int x = 0;
        int y = 80;
        int z = y/x;
        System.out.print(z);
    }
}
```

6. State the difference between character stream and Byte stream with an example.

7. Mention the benefits of using generics over non-generic code.

8. Justify the need of multithreaded programming with a real-time example.

9. What is source and listener in Java event handling?

10. List the features of AWT.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain in detail about the concepts of Object Oriented programming with an example. (7)

(ii) Write a Java code which accepts a set of 5 words from the user and perform reverse operation on each word and also display the resulting words in alphabetical order. (6)

Or

(b) (i) Explain the need of constructors and mention the type of constructors with an example for each type. (7)

(ii) Write a program in Java which gets 'n' numbers from the user in an array, compute and display the sum and average of the numbers. (6)

12. (a) (i) Mention the difference between class and interface also state the need of implementing interface in Java. (6)

(ii) Develop a Library interface which includes methods like drawbook( ) returnbook(fine), checkstatus( ) and reservebook( ) to carry out the task of library. Implement the library interface and perform the functionalities of library. (7)

Or

(b) (i) Discuss how reusability of code can be achieved through inheritance with an example. (6)

(ii) Develop a simple Employee information system application using Java. Create a class named 'Member' having the following members :

Data members – Name, Age, Phone number, Address, mailid and Salary It also has a method named 'displaySalary which prints the salary of the members.

Two classes 'Employee' and 'Manager' inherits the 'Member' class. The 'Employee' and 'Manager' classes have data members 'specialization' and 'department' respectively. Now, assign name age, phone number, address, mailid and salary to an employee and a manager by making an object of both of these classes and print the same. (7)

13. (a) What is an exception? How exceptions are handled in Java. Discuss the use of throw, throws keyword, try, catch and finally blocks. Write an interactive program to compute the square root of a number. The input values must be tested for validity. If it is negative, the user defined method MySqrt( ) should raise an exception. (13)

Or

(b) Explain in detail about all Input and Output Byte Stream class with simple examples. Write a program to copy the bytes from one file to another file. (13)

14. (a) (i) How a thread is created? Discuss the life cycle of threads. (6)

(ii) Write a java program that implements a multi-threaded application that has three threads. First thread generates a random integer every 1 second and if the value is even, second thread computes the square of the number and prints it. If the value is odd, the third thread will print the value of cube of the number. (7)

Or

(b) (i) What is synchronization? With an example explain how thread synchronization is carried out in Java. (6)

(ii) Justify the purpose of using Inter-thread communication. Demonstrate how threads are suspended, stopped and resumed with an example. (7)

15. (a) (i) Explain the features of Swings and brief the GUI components used in Swings. (6)

(ii) Write a Java Swing program to create a GUI which has a textbox and two buttons. One button will convert the text in the textbox from Upper case to Lower case and other resets the textbox. (7)

Or

(b) (i) Describe in detail about different layouts in Java GUI with an example. (6)

(ii) Write a program to create a frame with the following menus such that the corresponding geometric object is created when a menu is clicked Circle, rectangle, line, and arc. (7)

PART C — (1 × 15 = 15 marks)

16. (a) Develop a Java GUI application to implement a Vending Machine which follows following requirements :

(i) Accepts coins of ₹ 1, ₹ 5, ₹ 10, ₹ 25, ₹ 50

(ii) Allows user to select products (Chocolate(10), Snack(25), Nuts(50), Juice(20))

(iii) Allow user to take refund by cancelling the request

(iv) Return selected product and remaining change, if any

(v) Allow reset operation for vending machine supplier.

Use multithreading, inheritance, exception handling mechanism in appropriate scenario.

Or

(b) Create a Java console application for Dessert Shop which sells chocolates, cookies, ice cream and icecream with topping. Implement the following :

Dessert Item is Abstract class which has abstract method as getcost, it can have other non-abstract methods also. Candy, cookie and icecream class will be derived from Dessert Item and Icecream with topping are derived from Icecream class. Cost of candy should be 10rs per item, Cost of Cookie should be 20rs for 10 Cookies, Cost of Icecream should be 100rs per scoop. Cost of Icecream with toppings will have the base price of icecream + topping price. The price of topping varies as follows : Caramel-25rs, Chocolate coating-30rs, Nuts-40rs, and Fruit-45rs. All Dessert Item have calories, you can set and get calories for each Desserts available in shop. There will be checkout class where total cost of the items is calculated after adding CGST and SGST. Output will be displayed as item name, quantity and its price. Implement Run-time polymorphism using these classes for this Java application. Use excepting handling techniques wherever it is necessary.

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