Indian Association for the Cultivation of Science

(Deemed to be University under *de novo* Category)

Master's/Integrated Master's-PhD Program/Integrated Bachelor's-Master's Program/PhD Course

End-Semester Examination-Spring 2024

Subject: Object-Oriented Programming with Java ***Subject Code(s): MCS1201B***

Full Marks: 50 ***Time Allotted: 3 h***

Answer any five questions **10x5**

1. a) Java is a platform-independent language. Justify. 1+1+2+6

   b) What is finalization in Java?

   c) Explain the role of JVM.

   d) Design a class to represent a bank account. Include the following members:

   Data members

   Name of the depositor

   Account number

   Type of account

   Balance amount in the account

   Methods

   To assign initial values

   To deposit an amount

   To withdraw an amount after checking balance

   To display the name and balance

2. a) What are the special properties of a constructor? 2 +3+5

   b) Explain the term polymorphism with an example.

   c) An election is contested by 5 candidates. The candidates are numbered from 1 to 5 and the voting is done bymarking the candidate number on the ballot paper. Write a program to read the ballots and count the votes cast for each candidate using an array variable count. In case, a number read is outside the range of 1 to 5, the ballot should be considered as a 'spoilt ballot' and the program should also count the number of spoilt ballots.

3. a) What is a string in Java? 1+4+5

   b) Write a program to sort the names of five cities alphabetically. (take the names of cities randomly from user).

c) Write a program to implement three threads to display the following messages five times. First thread displays "Good Morning". Second thread displays " Good afternoon" and the third thread displays "Good night".

4. a) Describe different forms of inheritance with examples. 3+1+1+5

b) When do we declare a method or class final?

c) When do we declare a method or class abstract?

d) Explain the dynamic method dispatch in Java with an example program.

5. a) What is package? 1+6+3

b) How do we design a ~~built-in~~ user-defined package? Give an example.

c) Discuss the various levels of access protection available for packages and their implications.

6. a) What is thread? 2+1+1+2+4

b) What are two methods by which we may stop threads?

c) How do we set priorities for threads?

d) What is the difference between suspending and stopping a thread?

e) Describe the complete life cycle of a thread.

7. a) What is an Exception? 1+3+3+3

b) Create a try block that is likely to generate three types of exceptions and then incorporate necessary catch blocks to catch and handle them appropriately.

c) What is finally block? When and how is it used? Give a suitable example.

d) What is an applet? How do applets differ from application programs?