Roll No. ....

Total No. of Questions : 13] **[Total No. of Pages : 02**

J-3241[S-1097]

[2037]

M.Sc. (BI) (Semester - 4th)

INTRODUCTION TO JAVA AND INTRODUCTORY COMBINATORICS (M.Sc. - (BI) - 401)

Time : 03 Hours **Maximum Marks : 75**

Instruction to Candidates:

1) Section - A is **compulsory.**
2) Attempt any **Nine** questions from Section - B.

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Section - A

Q1) ***(15 x 2 = 30)***

a) Why do we call Java 'Object Oriented Language'?

b) What are various types of operators in Java?

c) What do you mean by JDK? What are its components?

d) What do you mean by Dynamic allocation?

e) What are the exceptions in a Java program?

f) How can we define Strings in Java?

g) How can you instantiate a variable in java?

h) What is method overriding?

i) What are the combinatorial numbers?

j) Explain the difference between permutations and combinations of some objects with the help of an example?

k) What is difference between discrete probability and classical probability?

l) Write all the combinations of ABCD taken 3 at a time.

m) There are 3! Permutations of the letters RPT. Those 3! Permutations include how many combinations of RPT?

n) You have 5 shirts, but you will select only 3 for your vacation. In how many different ways can you do this?

o) Write the 5th term in the expansion of $(a + b)^{10}$

P.T.O.

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Section - B

(9 x 5 = 45)

Q2) What are various features of an Object Oriented Programming?

Q3) What is difference between method overloading and method overriding?

Q4) What are various access modifiers in Java? What is their scope?

Q5) How can we declare and process arrays in Java?

Q6) Write a program in Java to check if a number is prime or not?

Q7) Write a program to find area of a triangle and circle using method overloading?

Q8) Explain the concept of various types of inheritance with the help of an example.

Q9) Explain the inclusion-exclusion principle with the help of an example.

Q10) A door can be opened only with a security code that consists of five buttons: 1, 2, 3, 4, 5. A code consists of pressing any one button, or any two, or any three, or any four, or all five. How many possible codes are there?

Q11) State the binomial theorem. In the expansion of $(x - y)^{15}$, calculate the coefficients of x^3y^{12} and x^2y^{13}.

Q12) The police have cornered a criminal in a small 23 home community. If they have only 46 hours to find him, and they can fully search one house in 2 hours and 23 minutes hours, will they find him?

Q13) How many 5-digit *odd* numbers can you make?

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