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| **SESSION** | **september 2023** |
| **PROGRAM** | **MCA** |
| **SEMESTER** | **I** |
| **course CODE & NAME** | **DCA6103 foundation of Mathematics** |
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**Set-I**

**Q1. State inclusion-exclusion principle. In a class of 1000 students, 625 students pass in Mathematics and 525 pass in Data Structure. How many students pass in Mathematics only and how many students pass in Data Structure only?**

**Ans 1.**

The Inclusion-Exclusion Principle is a fundamental concept in combinatorics and set theory. It provides a way to calculate the number of elements in the union of multiple sets. The principle is based on the idea of adding and subtracting the sizes of various intersections of the sets to avoid overcounting.

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**Q2.**

1. **Evaluate .**
2. **Evaluate the followings:**

**(i)**

**(ii)**

**Ans 2a.**

Integrate by parts using the formula , where and .

**3. Apply Cramer’s rule to solve the system of equations: ; 2; .**

We have given a system of equations.

Now we solve this system by using Cramer rule.

So we have,

**Set-II**

**4. Check whether the following is Tautology or Contradiction:**

**(p∨q)∨(∼p)**

**∼[p∨(∼p)]**

**Ans 4.**

Lets break down the problem step-by-step and use logical reasoning to find the solution.

The statement provided is :

(p∨q)∨(¬p)

To determine if this

**5. Express the following complex numbers in the polar form and hence find their modulus and amplitude.**

**(i) (ii).**

Ans 5.

**(i)**

formulas:

where

* is the modulus of the complex number ,
* is

**6.**

**A .Find where and .**

**B. Find the divergence and curl of at point**

**Ans 6a.**

Given that,