65911
MATHEMATICS-1

TP C

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OBJECTIVES:

To acquaint the students with the basic terminology of Algebra.

To be able to understand the complex numbers which are being used in electrical engineering.

To be able to understand the binomial expansion.

To be able to use the knowledge of trigonometry in solving problems of engineering importance.

SHORT DESCRIPTION:

Algebra: AP & GP, polynomials & polynomial equations, complex number, permutation & combination, binomial

theorem for positive integral index and negative & fractional index.

Trigonometry: ratio of associated angles, compound angles, transformation formulae, multiple angles and sub-multiple

angles.

DETAIL DESCRIPTION :

1. Understand the concept of Determinant.

1.1 Define Determinant.

1.2 Find the properties of Determinant..

1.3 Solve the problem of Determinants.

1.4 Apply Cramer's rule to solve the linear Equation.

2. Understand the concept of the Matrix.

2.1 Define Matrix.

2.2 Find the properties of Matrix..

2.3 Find the Rank of Matrix.

2.3 Solve the problem using Matrix.

3. Apply the concept of **polynomial in solving** the **problems**.

3.1 Define polynomials and polynomial equation.

3.2 Explain the roots and co-efficient of polynomial equations.

3.3 Find the relation between roots and co-efficient of the polynomial equations.

3.4 Determine the roots and their nature of quadratic polynomial equations.

3.5 Form the equation when the roots of the quadratic polynomial equations are given.

3.6 Find the condition of the common roots of quadratic polynomial equations.

3.7 Solve the problems related to the above.

4 Understand **the** concept **of complex numbers**.

4.1 Define complex numbers.

4.2 Perform algebraic operation (addition, subtraction, multiplication, division, square root) with complex number

of the form a + ib.

4.3 Find the cube roots of unity.

4.4 Apply the properties of cube root of unity **in** solving problems.

5 **Apply** the **concept** of permutation.

5.1 Explain permutation.

5.2 Find the number of permutation of n things taken r at a time when,

i) Things are all different.

ii) Things are not all different.

5.3 Solve problems related to permutation:

i) Be arranged so that the vowels may never be separated.

ii) From 10 men and 6 women a committee of 7 is to be formed. In how many ways can this be done so as to

include at least two women in the committee.

6 **Apply** the concept **of Combination**.

6.1 Explain combination.

6.2 Find the number of combination of n different things taken r at a time.

6.3 Explain nCr, nCn, nCO

6.4 Find the number of combination of n things taken r at a time in which p particular things

i) Always occur ii) never occur.

6.5 Establish i) ncr = nCn-r

ii) ncr + nCr-1 = n+1Cr

6.6 Solve problems related to the combination.

7 Apply the concept **of** associated **angles**.

7.1 Define associated angles.

7.2 **Find** the sign of trigonometric function in different quadrants.

7.3 Calculate trigonometric ratios of associated angles.

7.4 Solve the problems using the above.

8 Apply the **principle** of trigonometric ratios of **compound** angles**.**

8.1 Define compound angles.

8.2 Establish the following relation geometrically for acute angles.

i) sin(A + B) = sin A cos B + cos A sin B.

ii) cos (A + B) = cosA cosB ± sinAsinB.

8.3 Deduce formula for tan (A + B), Cot (A + B).

8.4 Apply the identities to work out the problems:

Find the value of sin 750, tan 750.

i)

sin75° + sin15°

ii)

Show that

sin75° - sin15°

$\sqrt{\sqrt{3}}$

iii) if a + B = 0, tana + tan B = b, cot a+ cot ß = a,

Show that (a - b) = ab cot 0.

9. Apply the principle of Transformation of formulae

9.1 Define the Transformation of formulae and important theorem.

9.2 Solve the problems using this law.

10 Apply the concept of ratios **of multiple** angles.

10.1 State the identities for sin 2A, cos 2A and tan 2A. 12.2 Deduce formula for sin 3A, cos 3A and tan 3A. 12.3 Solve the problems of the following types.

10.2 Important theorems

10.3 Solve the problems using these theorems.

11. Apply the concept of Inverse circular function

11.1 Explain the term inverse circular function and principle value of a trigonometrical ratio

11.2 Deduce mathematically the fundamental relations of different circular functions

11.3 Convert a given inverse circular function in terms of other function

11.4 Define geometric method

11.5 Solve problems using these methods

12 Apply the concept of Trigonometrical properties of triangles

12.1 Elements of Triangle

12.2 Sign law of triangle

12.3 Cosign law of triangle

12.4 Define the area of triangle

12.5 Define important theorems

12.6 Solve the problems of the following types

13 Define the Co-ordinates to find lengths and area

13.1 Define the Co-ordinates of a point
13,2 Define the different types of co-ordinates of point
13.3 Find the distance between two points
13.4 Define dividation laws
13.5 Solve the problems using these laws

14 The equation of straight lines in calculating various parameter

14.1 Define locus of a point
14.2 Find the locus of a point
14.3 Solve the problems

15 Define the Circle

15.1 Definition of circle, center and radius of a circle
15.2 Find the equation of a circle in the form
15.3 Find the equation of a circle deescribed on the line joining (x1,y1) and (x2,y2)
15.4 Define tangent and normal
15.5 Find the condition that a straight line may louch a circle
15.6 Find the equations of triangle and normal to a circle at any point
15.7 Solving the problems

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