Semester I

Mat/ Sem I/ C 1 – Analytical Geometry 2D, Trigonometry

Instruction: -

Ten questions will be set. Candidates will be required to answer **Seven Questions.**

Question no. 1 will be **Compulsory** consisting of 10 short answer type covering entire syllabus uniformly. Each question will be of 2 marks. Out of remaining 9 questions candidates will be required to answer 6 questions selecting at least one from each group. Each question will be of 10 marks.

GROUP - A

ANALYTICAL GEOMETRY OF TWO DIMENSIONS

Change of rectangular axes. Condition for the general equation of second degree to represent parabola, ellipse, hyperbola and reduction into standard forms. Equations of tangent and normal (Using Calculus). Chord of contact, Pole and Polar. Pair of tangents in reference to general equation of conic. Axes, centre, director circle in reference to general equation of conic. Polar equation of conic. **5 Questions**

GROUP - B

HIGHER ALGEBRA & TRIGONOMETRY

Statement and proof of binomial theorem for any index, exponential and logarithmic series. **1 Question**

De Moivre's theorem and its applications. Trigonometric and Exponential functions of complex argument and hyperbolic functions.
Summation of Trigonometrical series.
Factorisation of $\sin \theta$, $\cos \theta$. **3 Questions**

Books Recommended:

1. Analytical Geometry & Vector Analysis – B. K. Kar, Books & Allied Co., Kolkata
2. Analytical Geometry of two dimension – Askwith
3. Coordinate Geometry – S L Loney.
4. Trigonometry – Das and Mukherjee
5. Trigonometry - Dasgupta

Semester I
Mat/ Sem II/ C 2 – Differential Calculus and Vector Calculus

Instruction: -

Ten questions will be set. Candidates will be required to answer **Seven Questions.**

Question no. 1 will be **Compulsory** consisting of 10 short answer type covering entire syllabus uniformly. Each question will be of 2 marks. Out of remaining 9 questions candidates will be required to answer 6 questions selecting at least one from each group. Each question will be of 10 marks.

GROUP - A

DIFFERENTIAL CALCULUS

Successive differentiation, Leibnitz's theorem. Maclaurin and Taylor series expansion.   **1 Question**

Partial differentiation, Euler's theorem for functions of two variables, Total differential, Jacobian.   **2 Questions**

Tangent and normal, curvature. Asymptotes, Maxima and Minima of functions of two variables, Lagrange's multipliers.   **2 Questions**

GROUP - B

VECTOR CALCULUS

Product of three and four vectors, work done, moment of a vector about a point and a line. Scalar and vector point functions, differentiation of a vector function of scalar variables. Gradient, Divergence and Curl, second order operators in Cartesian coordinate system.   **4 Questions**

Books Recommended:

1. Calculus – G B Thomas & R L Finney.
2. Differential Calculus – Das & Mukherjee.
3. Vector Calculus – Dasgupta.
4. Vector Calculus – Shanti Narayan