MT-002 Mathematics – II

Functions:

Definitions, One-one function, onto function, even function, odd function, exponential function, trigonometric function and logarithmic function, graph of functions.

Differential Calculus:

Limits: Basic concepts; limit of form $\{(\sin x) / x\} = 1$; when x tends to zero. Exponent functions and type ax etc. limit as x tends to infinity. Continuity: Continuity and discontinuity of function. Derivatives: Differentiation of product and quotient formula, trigonometric functions, exponents and logarithmic functions. Application of derivatives: minima and maxima, tangent and normal, velocity and acceleration, rate of reaction etc.

Integral Calculus:

Basic Integration: Integrals of sum, powers of trigonometric functions, exponent functions and logarithmic functions. Integration by Substitution method; Integration by Parts, Integration by Partial Fractions, Application of integration: Area, volume, velocity and acceleration.

Coordinate Geometry:

Lines: Find length, mid-point, gradient of line segment, given the coordinates of end points. Different forms of equation of a line. Angle between two lines, distance of a point from a line.

Conic Sections:

Circle: Equation of circle using radius and coordinate of center. Tangents and normal. Parabola: Equation of parabola, focus, vertex, directrix and intersection of parabola. Ellipse: Equation of ellipse, eccentricity, foci, latus rectum, major and minor axes. Hyperbola: Equation of hyperbola, foci, directrices, eccentricity and latus rectum etc.

Textbook(s):

1. Mathematics for class XI, Sindh Text Board. Publisher: Gaba Educational Books, Urdu Bazar, Karachi.
2. Mathematics for class XII, Sindh Text Board. Publisher: Gaba Educational Books, Urdu Bazar, Karachi.

Reference Book(s):

1. Mark J. Christensen, “Computing for Calculus”, 1st Edition, Academic Press, 1981.
2. L. D. Lay, “Probability and Statistics for Engineering and the Sciences”, 9th Ed., 2015, Cengage Learning, Boston, MA, USA.
3. Howard Anton, Irl Bivens, Stephen Davis, “Calculus”, 10th Ed, 2011, John Wiley & Sons Inc.
4. “Calculus and Analytic Geometry”, MATHEMATICS 12 (Mathematics FSc Part 2 or HSSC-II), Punjab Text Book Board Lahore.