

Paper II: CALCULUS-I

I. Successive differentiation:

n^{th} derivatives of the functions: $(ax+b)^n$, $\log(ax+b)$, e^{ax} , $\sin(ax+b)$, $\cos(ax+b)$, $e^{ax}\sin(ax+b)$, $e^{ax}\cos(bx+c)$, Leibnitz's theorem and its applications **07Hrs**

II. Functions of two and three variables:

Partial derivatives, Euler's theorem for homogeneous functions (two variables) and its applications. Total differential, Total derivative and partial derivative of composite functions, Jacobians properties and functional relations. Jacobians of implicit functions. **10Hrs**

III. Polar co-ordinates:

Polar co-ordinates, angle between radius vector and a tangent. Angle of intersections of curves, perpendicular distance drawn from the pole to the tangent and pedal equations (polar and Cartesian) **15Hrs**

IV. Theory of Plane Curves:

Points of inflection, concavity and convexity of curves, derivative of an arc in polar, Cartesian and parametric forms. Radius of curvature of a plane curve in Cartesian, parametric and polar forms, Centre of curvature and Evolutes, Envelops. **20Hrs**

NOTE: INTERNAL MARK: 25

References:

1. D.C.Pavate: Modern College Calculus.(Macmillan and Company Limited)
2. Shanti Narayan. : Differential Calculus (S Chand & Company Limited).
3. L.Ben: Calculus Vol-I and II (IBM).
4. Murray.R. Spiegel: Advance Calculus (Schaum's Outline Series).
5. G.K. Ranganath: A text book of Mathematics. (S Chand & Company Limited)
6. Rudraiah et al: College Mathematics Vol-I (Sapna Book House, Bangalore).