

BM-112
(Semester-1)

Calculus

External Marks: 40/27

Internal Marks: 10/6

Time: 3 Hours

Note: Paper setter will set nine questions in all, selecting two questions from each section and one Compulsory question consisting of five parts distributed over all four sections. Candidates are required To attempt five questions, selecting at least one question from each section and the compulsory Question.

Section-I

Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

Section-II

Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature, evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.

Section-III

Tracing of curves in Cartesian, parametric and polar co-ordinates. Reduction formulae. Rectification, intrinsic equations of curve.

Section-IV

Quadrature (area) Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution. Theorems of Pappu's and Guilden.

REFERENCES

- Differential and Integral Calculus : Shanti Narayan.
- Murray R. Spiegel : Theory and Problems of Advanced Calculus. Schaun's Outline series. Schaum Publishing Co., New York.
- N. Piskunov : Differential and integral Calculus. Peace Publishers, Moscow.
- Gorakh Prasad : Differential Calculus. Pothishasla Pvt. Ltd., Allahabad.
- Gorakh Prasad : Integral Calculus. Pothishala Pvt. Ltd., Allahabad.