BM-231

(Semester-III)

Advanced 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

Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms.

Section-II

Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables.

Section-III

Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers.

Section-IV

Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature, Locus of centre of Spherical curvature, Involutes, evolutes, Bertrand Curves. Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.

REFERENCES

- C.E. Weatherburn : Differential Geometry of three dimensions, Radhe Publishing House, Calcutta
- Gabriel Klaumber : Mathematical analysis, Mrcel Dekkar, Inc., New York, 1975
- R.R. Goldberg : Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970
- Gorakh Prasad : Differential
- Calculus, Pothishala Pvt. Ltd., Allahabad
- S.C. Malik : Mathematical Analysis, Wiley Eastern Ltd., Allahabad.
- Shanti Narayan : A Course in Mathemtical Analysis, S.Chand and company, New Delhi
- Murray, R. Spiegel : Theory and Problems of Advanced Calculus, Schaum Publishing co., New York