

SARDAR PATEL UNIVERSITY , VALLABH VIDYANAGAR
SYLLABUS FOR B.Sc. SEMESTER - 1
US01CMTH22(P) (MATHEMATICS PRACTICAL)
FOUR HOURS PER WEEK (2 CREDIT)
Effective from June 2018
Marks:-50(External)

PROBLEMS AND EXERCISES IN CALCULUS

List of Practicals :

- (1) Hyperbolic Functions ,Successive Derivative, Higher Order Derivatives: n^{th} Derivatives of Standard Form ,Leibnitz's Theorem and its Applications,
- (2) L'Hospital Rule , Technics of Sketching Conics , Reflection Properties of Conics , Rotation of axes and Second Degree Equations,Classification into Conics using Discriminant .
- (3) Curve Tracing in Cartesian coordinates ,Parametric Equations,Tracing of Parametric Curves
- (4) Polar coordinates, Curve Tracing in Polar coordinates , Polar Equation of Conics .
- (5) Reduction Formulae for Integration of $\sin^n x$, $\cos^n x$, $\sin^p x \cos^q x$, $\tan^n x$, $\cot^n x$, $\sec^n x$, $\operatorname{cosec}^n x$,Volumes by Slicing , Disks and Washers Methods , Volumes by Cylindrical Shells.
- (6) Arc Length,Arc Length of Parametric Curves and Polar Curves , Derivation of Intrinsic Equations of a Curve ,Area of Surface of Revolution.
- (7) Curvature , Radius of Curvature For Cartesian , Parametric and Polar Equations,Length of Arc as a Function .
- (8) Limit and Continuity of a Functions of Two Variables, Neighbourhood of a Point, Partial Derivatives,Euler's Theorem on Homogeneous Functions of Two and Three Variables
- (9) Theorem on Total Differentials, Differentiation of Composite and Implicit Functions
- (10) Introduction to Vector Functions,Limits and Continuity of Vector Functions. Differentiation and Integration of Vector Functions,

NOTE :

- (1) Problem solving skill in mathematics is an important aspect in the teaching of mathematics.
- (2) There would be a batch of problem solving session will be of four hours per week and they will be conducted in batches of students of size 20 to 25 per batch.
- (3) The candidate shall have to produce at the time practical Examination the record of their prescribed Laboratory work, certified by the Head of the Department.

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Recommended Texts :

- (1) Shanti Narayan , Differential Calculus , 14th Edition, S.Chand & Company Ltd., New Delhi, 1996
- (2) Shanti Narayan , Integral Calculus , 14th Edition, S.Chand & Company Ltd., New Delhi , 1996
- (3) B.S.Grewal, Higher Engineering Mathematics, 36th edition , Khanna Publ.
- (4) Dr.D J Karia, N Y Patel, B P Patel, M L Patel ,Introduction to Calculus and Differential Equations , Roopal Prakasan ,Vallabh Vidyanagar
- (5) S.K.Patel, B.P.Patel, H.R.Kataria, B.L.Ghodadra, Calculus and Matrix Algebra. University Granthnirman board, Ahmedabad-6
- (6) Louis Leithod , The calculus with Analytic Geometry, Harper- Collins Pub.
- (7) G.B.Thomas and R.L.Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005.
- (8) M.J.Strauss , G.L.Bradley and K.J.Smith, Calculus, 3rd Ed., John Wiley and Sons(Asia)P.Ltd., Singapore, 2002.
- (9) H.Anton, I.Bivens, S.Devis, Calculus, 7th Ed., John Wiley and sons (Asia) Pt.Ltd., Singapore, 2002.
- (10) Maurice D.Weir, Joel Hass, Frank R.Giordano , Thomas' Calculus , Pearson Education, Delhi.
- (11) H.M.Vasavada , Analytical Geometry of Two and Three Dimensions , 1992