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|  | **Tentative lectures break up for MATHEMATICS-I(AUTUMN 2017-18)**  **Total Lectures: 41** |
| **S.NO** | **Functions of one Variable (8 Lectures)** |
| 1 | 1. Rolle’s theorem, Cauchy’s mean value theorem (Lagrange s mean value theorem as a special case)[without proof] 2. Taylor’s and Maclaurin s theorems with remainders**[** without proof**]** 3. indeterminate forms**[**without proof**]** |
| 2 | **Functions of several variables): (12 Lectures)** |
|  | **i.**Limit, continuity, partial derivatives and their geometrical interpretation,  **ii.** differentiability of functions of several variables,  **iii.** differentials, derivatives of composite and  implicit functions, derivatives of higher order and their commutativity  **iv.**Euler,s theorem on homogeneous functions, harmonic functions  **v.** Taylor’s expansion of functions of several variables,  **vi.** maxima and minima of functions of several  variables, Lagrange’s method of multipliers**.** |
| 3 | Ordinary Differential Equations **(10 Lectures)** |
|  | **i.** First order differential equations - exact, linear and Bernoulli s form, **ii.**second order differential equations with constant coefficients, **iii.** method of variation of parameters, **iv.** general linear differential equations with constant coefficients, Euler’s equations. **V.**System of differential equations.\*\* A brief discussion on Sequence and Series, comparation test, ration test, root test(without proof) (2L) |
| 4 | **Complex Variables (11 Lectures)** |
|  | **i.** Limit, continuity, differentiability and analyticity of  functions, Cauchy-Riemann equations,  **ii.**line integrals in complex plane, Cauchy’s  integral theorem(without proof), independence of path, existence of indefinite integral,  **iii**. Cauchy’s integral formula, derivatives of analytic functions, (without proofs)  **iv.**Taylor s series, Laurent s series, Zeros and singularities, Residue theorem. \*concavity and convexity of a curve, points of inflexion, asymptotes, Curvature. |

**References:**

[K]: Kreyszig: Advanced Engineering Mathematics, 10th Edition

[K1]: Kreyszig: Advanced Engineering Mathematics, 9th Edition

[SN] : S. Narayan and R. K. Mittal: Integral Calculus, Revised Edition

[P-I, P-II respectiely]: N. Piskunov: Differential and Integral Calculus Volume I & II, Reprint 1999

* \*After complex part is over
* \*\* Before complex part is to start