Paper VIII: Special Functions and PDE-I

I. Special Functions:

Legendre's differential equation, Legendre polynomials $P_n(x)$ as a solution, Rodrigue's formula, generating polynomials theorem, orthogonal property and basic relation. Recurrence relations.

Bessel differential equation, Bessel function $J_n(x)$ as a solution – generation formulae, integral formula for $J_n(x)$, orthogonal property, recurrence relations, basic relation problems there on.

Laguerre's differential equations, Laguerre polynomials $L_n(x)$ as a solution, generating function, orthogonal property, recurrence relations, basic relation problems there on. Hermite's differential equations, Hermite polynomials $H_n(x)$ as a solution, generating function, orthogonal property, recurrence relations, basic relation problems there on.   **32 Hrs**

II Partial Differential Equations (PDE-I):

Formation of Partial Differential Equations, Lagrange's linear equations Pp+Qq=R, Standard types of first order linear Partial Differential Equations and equations reducible to standard form, Charpit's method. Standard type of Non-linear PDE of first kind.   **20 Hrs**

Note: Internal Marks-25

References:

1. Ayres F : Differential Equations (Schaum's Outline Series)
2. Stophenson.G: An introduction to Partial Differential Equations(ELBS)
3. B.S Grewal: Higher Engineering Mathematics (Khanna Publishers).
4. M.D Raisinghania: Advanced Differential equations (S.Chand & co)
5. Ian N. Sneddan: Elements of Partial Differential Equations, McGraw Hill.