

YMCA University of Science and Technology ,Faridabad

M.Sc (Mathematics)((3rd Semester) (Under-CBS Scheme)

Partial Differential Equation (MTH-515)Dec.-2017

M.Marks:60

Time:3hrs

Note:All questions are compulsory in Part-I

Attempt any four questions from Part -II

Part-I

Que.1(a) Briefly explain the types of Partial Differential Equation after defining the Partial Differential Equation of Kth order.

(b)State Strong Maximum Principle and uniqueness for Laplace Equation.

(c) State Representation formula in terms of Green function .

(d)Define Green's formula, corrector function and Green function.

(e)Define Parabolic cylinder ,Parabolic boundary of U_T and Heat Ball.

(f)Define Heat Equation and State mean value property for Heat equation..

(g)State Reflection method for wave equation.

(h)State Uniqueness of solution for wave equation.

(i)Define Poisson Equation Uniqueness for Green's Function.

(j)State Fundamental solution of poisson equation.

(2*10=20)

Part-II

Que.2(a) Derive an expression for non-homogeneous Transport Equation.

(5)

(b)State and Prove Mean Value Formula for Harmonic Function.

(5)

Que.3 State and prove Dirichlet's principle. (10)

Que.4(a) Find the expression for the Fundamental solution of Heat Equation. (5)

(b) State and Prove Energy method for Heat Equation. (5)

Que.5 State and prove Euler-Poisson _Darboux equation. (10)

Que.6 Write Short note on :

(i) Complete integral

(ii) Envelopes

(iii) Hamilton Jacobi equations

(iv) Hopf-Lax formula

(10)

Que.7 Find the solution of wave equation of 3-dimension. (10)