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OR

State and prove the Plancherel's theorem ?

Q.8 Derive stationary phase for the wave equation ?

OR

Derive Oscillating solution for wave equation ?

SECTION - C

Long answer type questions with maximum word limit 500. (4x12=48)

Q.9 State and prove the uniqueness and backward uniqueness for Heat equation ?

OR

(i) State and prove the Euler-Poisson Darboux equation?
(ii) Derive solution by spherical means for $n=3$

Q.10 State and prove the Lax-oleinik formula ?

OR

Derive Asymptotics in L^1 - norm ?

Q.11 Derive Barenblatt's solution to the porous medium equation ?

OR

(i) Derive Bessel potentials.
(ii) Derive Legendre transform.

Q.12 State and prove the Cauchy Kovalevskaya theorem ?

OR

Derive periodic homogenization of an elliptic equation ?

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Roll No.

W - 3202

Third Semester Examination 2021

M.Sc. (Mathematics)

Partial Differential Equations

Paper - II

Time :- 3 Hrs.

M.M. 80

SECTION - A

(4x3=12)

Very short answer type questions.(maximum 3 lines)

Q.1 Derive non- homogeneous problem for transport equation ?

Q.2 Explain the F-quasilinear for nonlinear partial differential equation $F(Du,u,x)=0$?

Q.3 Derive Hodograph transform ?

Q.4 State and prove Majorants ?

SECTION - B

Short answer type questions with maximum word limit 150. (4x5=20)

Q.5 Derive fundamental solution for Laplace's equation ?

OR

State and prove the maximum principle for the Cauchy problem ?

Q.6 Derive characteristics ordinary difference equation for nonlinear first order partial differential equation ?

OR

Derive characteristics for the Hamilton- Jacobi equation?

Q.7 Derive Hopf-Cole transform ?

P.T.O.