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Submission Deadline : 11/11/2020 10:00

SECOND QUIZ A

Q.1 [MCQ Question, 3 Marks, answer it in the box below]:

Choose the correct options from below:

a). $u_x u_y u_z = 32$ is a linear PDE.

b). $u_x + \sin(u) = 0$ is a fully non linear PDE.

c). $u_x u_y u_z = 32$ is a PDE of order 3.

d) $\frac{1}{u}u_x + \frac{1}{u}u_y = 1$ is a quasilinear PDE.

e) $u_x + u_y = u$ is a linear PDE.

f) none of the above.

This is a long answer type question. You can either upload a file or type your answer below.

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Q.2 [MCQ Question, 3 Marks, answer it in the box below]:

Consider the following problem:

$\frac{u_x}{2} + u_y = 0,\ u(x, 2x) = \sin(x)$

Choose the correct options:

a) The above problem has infinitely many solutions.

b) The above problem has a unique solution.

c) The above problem does not admit any solution.

d) The non characteristics condition is satisfied at the point (1,2).

e) none of the above.

This is a long answer type question. You can either upload a file or type your answer below.

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Q.3 [Descriptive Question, 7 Marks]

Consider the following problem:

$u_x - 2u_y = u^2,\ u(x,0) = 1.$

a) write down the characteristics equation for the above problem. (3 marks)

b) Solve it. (3 marks)

c) Does the projected characteristics intersects? Justify your answer. (1 marks)

This is a long answer type question. You can either upload a file or type your answer below.

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Q.4 [Descriptive Question, 6 Marks] :

Find the set of all eigenvalues and their corresponding eigenfunctions for the following problem:

$y''(t) + \lambda y(t) = 0 \text{ on } (\pi, 2\pi),\ y(\pi) = y(2\pi) = 0.$

This is a long answer type question. You can either upload a file or type your answer below.

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