

MSO203B: Partial Differential Equations
Users Online : 56

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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or

A screenshot of a rich text editor interface. The toolbar at the top contains icons for cut, copy, paste, undo, redo, text color, background color, bulleted list, numbered list, link, unlink, source code, and a flag icon. Below the toolbar is a row of formatting buttons: bold (B), italic (I), underline (U), strikethrough (ABC), subscript (x_e), superscript (x²), and a text color button (I_x). To the right of these are alignment buttons (left, center, right, justified) and a 'Styles' dropdown menu set to 'Normal'. The main content area shows a red scribble on the left and the handwritten text 'd, e' in red in the center.

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

Consider the following problem:

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

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.

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Q.3 [Descriptive Question, 7 Marks]

Consider the following problem:

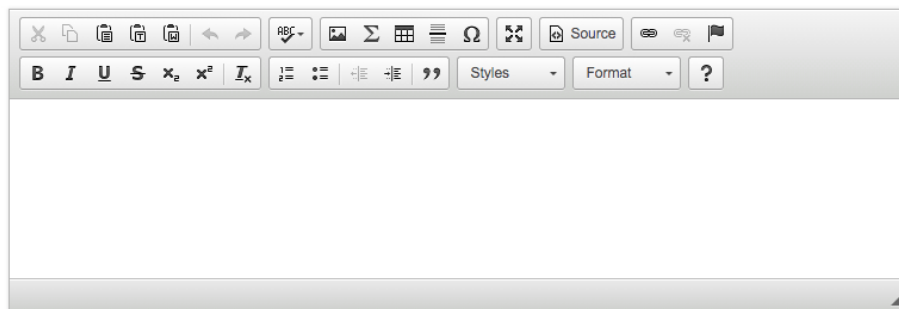
$$u_x - 2u_y = u^2, u(x, 0) = 1.$$

- 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)

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A rich text editor interface with a toolbar at the top containing icons for cut, copy, paste, undo, redo, bold, italic, underline, strikethrough, subscript, superscript, text color, background color, bulleted list, numbered list, link, unlink, and source code. Below the toolbar is a large text area for typing the answer.

Q.4 [Descriptive Question, 6 Marks]:

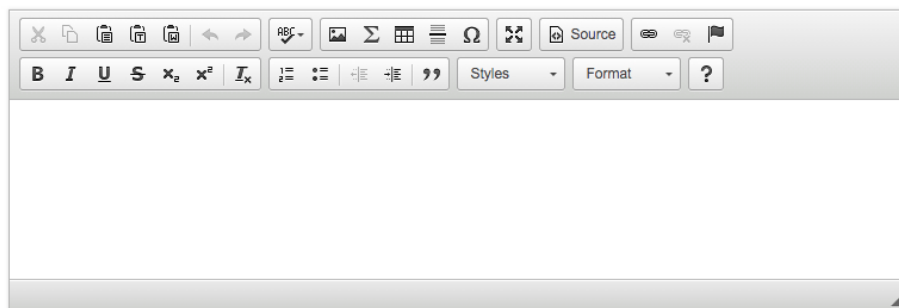
Find the set of all eigenvalues and their corresponding eigenfunctions for the following problem:

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

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

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A rich text editor interface with a toolbar at the top containing icons for cut, copy, paste, undo, redo, bold, italic, underline, strikethrough, subscript, superscript, text color, background color, bulleted list, numbered list, link, unlink, and source code. Below the toolbar is a large text area for typing the answer.

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