Lecture 17 Activity Results for Test Student

Score for this attempt: 1 out of 1
Submitted Mar 5 at 10:10am
This attempt took 2 minutes.

Question 1

1 / 1 pts

Which of the following is correct? **Select all that apply.**

- A quasi-linear PDE is a semi-linear PDE.
- A semi-linear PDE is a linear PDE.
- Correct! ✓ A semi-linear PDE is a quasi-linear PDE.
- Correct! ✓ A linear PDE is a semi-linear PDE.
- A quasi-linear PDE is a linear PDE.
- Correct! ✓ A linear PDE is a quasi-linear PDE.

Additional Comments:

Question 2

0 / 0 pts

Which of the following is correct? **Select all that apply.**

- For $u_t + b(x,t)u_x = 0$, characteristics are straight lines.
- Correct! ✓ For $u_t + bu_x = c_1(x,t)u + c_2(x,t)$, characteristics are straight lines.
- For $u_t + b(x,t)u_x = c_1(x,t)u + c_2(x,t)$, characteristics are straight lines.
- Correct! ✓ For $u_t + bu_x = c(x,t,u)$, characteristics are straight lines.
- For $u_t + b(u)u_x = c(u)$, characteristics are straight lines.
- Correct! ✓ For $u_t + b(u)u_x = 0$, characteristics are straight lines.

Additional Comments:

Question 3

0 / 0 pts

Consider the IVP $\begin{cases} u_t + uu_x = 0 \\ u(x,0) = \tanh(x) \end{cases}$

Which of the following is correct? **Select all that apply.**

- Characteristics are converging straight lines and the classical solution exists for $t \in (0, +\infty)$.
- Characteristics are converging straight lines and the classical solution ceases to exist at a finite time.
- Correct! ✓ Characteristics are diverging straight lines and the classical solution exists for $t \in (0, +\infty)$.
- Characteristics are diverging straight lines and the classical solution ceases to exist at a finite time.
- Characteristics are not straight lines.
- Characteristics are parallel straight lines.

Additional Comments:

Question 4

0 / 0 pts

Consider the IVP $\begin{cases} u_t - uu_x = 0 \\ u(x,0) = \tanh(x) \end{cases}$

Which of the following is correct? **Select all that apply.**

- Characteristics are converging straight lines and the classical solution exists for $t \in (0, +\infty)$.
- Correct! ✓ Characteristics are converging straight lines and the classical solution ceases to exist at a finite time.
- Characteristics are diverging straight lines and the classical solution exists for $t \in (0, +\infty)$.
- Characteristics are diverging straight lines and the classical solution ceases to exist at a finite time.
- Characteristics are not straight lines.
- Characteristics are parallel straight lines.

Additional Comments:

Question 5

0 / 0 pts

The characteristics of $\begin{cases} u_t + b(x,t,u)u_x = c(x,t,u) \\ u(x,0) = f(x) \end{cases}$ are given by

$$\begin{cases} \dfrac{dt}{d\tau} = 1, & \dfrac{dx}{d\tau} = b(x,t,v), \quad \dfrac{dv}{d\tau} = c(x,t,v) \\ t(0) = 0, & x(0) = s, \quad v(0) = f(s) \end{cases}.$$

Which of the following is correct? **Select all that apply.**

- Characteristics do not intersect in the space of (x, t).
- Correct! ✓ Characteristics do not intersect in the space of (x, t, v) but they may intersect in the space of (x, t).
- Characteristics may intersect in the space of (x, t, v).
- Correct! ✓ Characteristics are affected by function $f(s)$.
- Characteristics are independent of function $f(s)$.

Additional Comments:

Question 6

0 / 0 pts

The characteristics of $\begin{cases} u_t + b(x,t)u_x = c(x,t,u) \\ u(x,0) = f(x) \end{cases}$ are given by

$$\begin{cases} \dfrac{dt}{d\tau} = 1, & \dfrac{dx}{d\tau} = b(x,t), \quad \dfrac{dv}{d\tau} = c(x,t,v) \\ t(0) = 0, & x(0) = s, \quad v(0) = f(s) \end{cases}.$$

Which of the following is correct? **Select all that apply.**

- Correct! ✓ Characteristics do not intersect in the space of (x, t).
- Characteristics do not intersect in the space of (x, t, v) but they may intersect in the space of (x, t).
- Characteristics may intersect in the space of (x, t, v).
- Characteristics are affected by function $f(s)$.
- Correct! ✓ Characteristics are independent of function $f(s)$.

Additional Comments:

Question 7

0 / 0 pts

Consider the conservation law $\mathbf{u_t} + \left(F(u)\right)_x = 0$

Which of the following is correct? **Select all that apply.**

- Correct! ✓ A classical solution is always a weak solution.
- A classical solution may not be a weak solution.
- A weak solution is always a classical solution.
- Correct! ✓ A weak solution may not be a classical solution.
- It always has a classical solution for any initial condition $u(x,0) = f(x)$.

Additional Comments:

Question 8

0 / 0 pts

Consider the conservation law $\mathbf{u_t} + u_x = 0$

Which of the following is correct? **Select all that apply.**

- $u(x,t) = \sin(x+t)$ is a weak solution.
- Correct! ✓ $u(x,t) = \sin(x-t)$ is a weak solution.
- $u(x,t) = e^{-(x+t)^2}\cos(x+t)$ is a weak solution.
- Correct! ✓ $u(x,t) = e^{-(x-t)^2}\cos(x-t)$ is a weak solution.
- $u(x,t) = \sin(x)$ is a weak solution.
- $u(x,t) = e^{-x}\cos(x)$ is a weak solution.

Additional Comments:

Fudge Points: –

You can manually adjust the score by adding positive or negative points to this box.

Final Score: 1 out of 1

Update Scores

Here's the latest quiz results for Test Student. You can modify the points for any question and add more comments, then click "Update Scores" at the bottom of the page.

Quiz Submissions

Attempt 1: 1

Test Student has 1 attempt left

Allow this student an extra attempt

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