

# (1) When is a field of some physical property *steady*?

- (A) When the material parcels in the field aren't moving.
- (B) When parcels in the field *conserve* the property (that is, each parcel's value of the property doesn't change over time).
- (C) When the property *at each location* doesn't change over time.
- (D) When an observer traveling through the field measuring the property *as they go, measures no change* in the property.

(2) To visualize a flow pattern, you first mark a fluid parcel. A short distance away in the direction of the fluid parcel's velocity, you mark a second parcel. A short distance away in the direction of the second parcel's velocity, you mark a third parcel, etc.

You then connect the series of marked parcels with a line.  
*What kind of line is this?*

- (A) A streamline
- (B) A pathline (trajectory)
- (C) A streakline
- (D) A timeline

(3) To visualize a flow pattern, you first mark a fluid parcel. That parcel (if it is moving) leaves and is replaced by a new one at the same location, which you mark. You repeat this process a number of times.

You then connect the series of marked parcels with a line.  
*What kind of line is this?*

- (A) A streamline
- (B) A pathline (trajectory)
- (C) A streakline
- (D) A timeline

(4) To visualize a flow pattern, you first mark the location of a fluid parcel. A short time later, you mark the location of the same parcel. A short time later, you mark the location of the same parcel (which might have moved again). You repeat this process a number of times.

You then connect the series of locations where you marked the parcel with a line. *What kind of line is this?*

- (A) A streamline
- (B) A pathline (trajectory)
- (C) A streakline
- (D) A timeline

(5) To visualize a flow pattern, you first mark a series of adjacent fluid parcels and connect them with a line. A short time later, during which time the parcels might have moved, you mark the same series of parcels and connect them with a line. You repeat this process a number of times at the same time interval.

*What is this series of lines called?*

- (A) A streamline
- (B) A pathline (trajectory)
- (C) A streakline
- (D) A timeline

(6) Which of the following types of “field lines” (flow visualization lines) can intersect themselves?

(There might be more than one correct choice; if there is, pick one of them.)

(A) Streamlines

(B) Pathlines (trajectories)

(C) Streaklines

(D) Timelines

(7) Which of the following types of “field lines” (flow visualization lines) can intersect other lines of the same type?

(There might be more than one correct choice; if there is, pick one of them.)

- (A) Streamlines
- (B) Pathlines (trajectories)
- (C) Streaklines
- (D) Timelines

(8) Under what circumstance will a streamline and a trajectory that start at the same location and time, be identical?

(A) When the flow is transient

(B) When the flow is steady

(C) When the flow is spatially uniform

(D) When the flow direction is spatially uniform



(9) True or false: At every point along a *streakline*, the streakline is parallel to the velocity of the fluid parcel at that point.

(A) True

(B) False

(10) True or false: At every point along a *streamline*, the streamline is parallel to the velocity of the fluid parcel at that point.

(A) True

(B) False

(11) True or false: At every point along a *trajectory*, the trajectory is parallel to the velocity of the fluid parcel at that point on the trajectory.

(A) True

(B) False