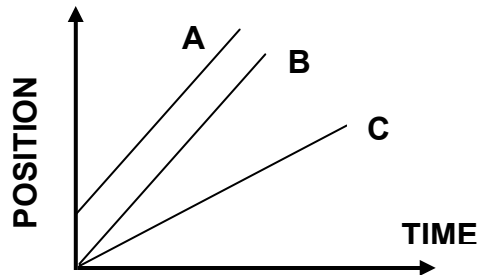


29:006 S 2005 PRACTICE QUESTIONS FOR EXAM 1
(the answers are given at the end)

- 1) A rock is dropped from rest from a great height. Ignore air resistance. How far has it fallen and what is its velocity 3 seconds after it is dropped?
- A) 15 m, 30 m/s B) 30 m, 45 m/s
C) 45 m, 30 m/s D) 30 m, 30 m/s
- 2) An elevator is moving up, but slowing down. Which of the following is true?
- A) The elevator's velocity is up, and its acceleration is up.
B) The elevator's velocity is up, and its acceleration is down.
C) The elevator's velocity is down, and its acceleration is up.
D) The elevator's velocity is down, and its acceleration is down
- 3) A 6.0 kg cart accelerates at 12 m/s^2 . The net force on the cart is
- A) 72 N B) 12 N C) 12 m/s^2 D) 2.0 N
- 4) A cart of mass 4.0 kg has two horizontal forces acting on it: a 60 N force to the right and a 40 N force to the left. What is the cart's acceleration?
- A) 5 m/s^2 to the right, B) 5 m/s^2 to the left
C) 15 m/s^2 to the right D) 10 m/s^2 to the left
- 5) Which line on the graph below of position versus time corresponds to the slowest moving object?
- A) A
B) B
C) C
D) All three lines correspond to the same speed.
E) Speed information cannot be obtained from this type of graph.



- 6) Which is bigger, static or sliding (kinetic) friction?
- A) Static B) Sliding (kinetic) C) They are equal.
D) The answer depends on the circumstance
- 7) Linear momentum is
- A) force times time B) force times distance.
C) work per time D) mass times velocity

- 8) You are bouncing up and down on a spring board, preparing to dive into the pool. While you are in the air above the board, your acceleration is
- A) zero because you are not touching anything.
 - B) upward and constant until you reach the peak, then it becomes downward and constant.
 - C) downward and constant.
 - D) initially upward but it gradually diminishes to zero as you reach the peak and then it gradually becomes more and more downward.
- 9) The moment of inertia of a long thin rod is smallest when it is spinning about an axis
- A) down the center of the rod lengthwise.
 - B) through the center of the rod, perpendicular to its length.
 - C) through the end of the rod, perpendicular to its length.
 - D) The moment of inertia is a constant, so A, B, and C are all equal.
- 10) What type of momentum does a spinning carousel have?
- A) centripetal momentum.
 - B) centrifugal momentum
 - C) linear momentum.
 - D) rotational momentum.
- 11) You go around a horizontal curve on a roller coaster at constant speed. What is your acceleration?
- A) Zero
 - B) Straight down
 - C) inward toward the center of the curve
 - D) outward away from the center of the curve
 - D) Straight up
- 12) After clearing the bar in the high jump, you land softly on a giant mattress. Landing on the mattress is much more comfortable than landing on a sand heap of equal size because
- A) you transfer less momentum to the mattress in coming to a stop than you would have transferred to the sand heap in coming to a stop.
 - B) the force that the mattress exerts on you to stop your descent is much less than the force that the sand heap would have exerted on you.
 - C) you transfer more momentum to the mattress in coming to a stop than you would have transferred to the sand heap in coming to a stop.
 - D) your velocity is less as you land on the mattress than it would have been if you'd landed on the sand heap.

- 13) Two equal mass cars collide on the air track. One is initially at rest. After they collide:
- A) they move off in opposite directions
 - B) the car that was initially moving stops and the other car moves off with twice the velocity that the other car had
 - C) both cars immediately stop moving
 - D) the car that was initially moving stops and the other car moves off with the same velocity that the other car had.
- 14) Your roommate's car has a pair of "fuzzy dice" hanging by a string from its rearview mirror. Yes, they're tacky but you don't have the heart to say anything. Anyway, these dice do a nifty job of indicating how the car is moving. For example, if the dice swing forward toward the car's windshield while the car is on a level road, you know that the car is
- A) accelerating backward.
 - B) accelerating forward.
 - C) traveling backward at a steady pace.
 - D) traveling forward at a steady pace
- 15) How much upward velocity must a ball have to reach a maximum height of 5 m?
- A) 10 m/s B) 100 m/s C) 50 m/s D) 20 m/s
- 16) Children are revolving around in a circle on a playground merry-go-round. If one child jumps off while it is moving directly outward, which of the following statements is correct?
- A) the merry-go-round spins faster because the rotational inertia is bigger
 - B) the merry-go-round spins faster because the rotational inertia is smaller
 - C) the merry-go-round spins faster because its rotational momentum increases
 - D) the merry-go-round spins slower because its rotational momentum decreases

ANSWERS

- | | |
|------|-------|
| 1) C | 9) A |
| 2) B | 10) D |
| 3) A | 11) C |
| 4) A | 12) B |
| 5) C | 13) D |
| 6) A | 14) A |
| 7) D | 15) A |
| 8) C | 16) B |