

16. A balloon of mass M is floating motionless in the air. A person of mass less than M is on a rope ladder hanging from the balloon. The person begins to climb the ladder at a uniform speed v relative to the ground. How does the balloon move relative to the ground?
- (A) Up with speed v
 (B) Up with a speed less than v
 (C) Down with speed v
 (D) Down with a speed less than v
 (E) The balloon does not move.

17. If one knows only the constant resultant force acting on an object and the time during which this force acts, one can determine the
- (A) change in momentum of the object
 (B) change in velocity of the object
 (C) change in kinetic energy of the object
 (D) mass of the object
 (E) acceleration of the object

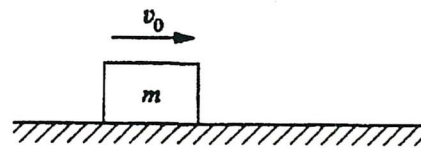
18. When an object is moved from rest at point A to rest at point B in a gravitational field, the net work done by the field depends on the mass of the object and
- (A) the positions of A and B only
 (B) the path taken between A and B only
 (C) both the positions of A and B and the path taken between them
 (D) the velocity of the object as it moves between A and B
 (E) the nature of the external force moving the object from A to B

19. An object is shot vertically upward into the air with a positive initial velocity. Which of the following correctly describes the velocity and acceleration of the object at its maximum elevation?

	<u>Velocity</u>	<u>Acceleration</u>
(A)	Positive	Positive
(B)	Zero	Zero
(C)	Negative	Negative
(D)	Zero	Negative
(E)	Positive	Negative

20. A turntable that is initially at rest is set in motion with a constant angular acceleration α . What is the angular velocity of the turntable after it has made one complete revolution?

- (A) $\sqrt{2\alpha}$
 (B) $\sqrt{2\pi\alpha}$
 (C) $\sqrt{4\pi\alpha}$
 (D) 2α
 (E) $4\pi\alpha$



21. An object of mass m is moving with speed v_0 to the right on a horizontal frictionless surface, as shown above, when it explodes into two pieces. Subsequently, one piece of mass $\frac{2}{5}m$ moves with a speed $\frac{v_0}{2}$ to the left. The speed of the other piece of the object is

- (A) $\frac{v_0}{2}$
 (B) $\frac{v_0}{3}$
 (C) $\frac{7v_0}{5}$
 (D) $\frac{3v_0}{2}$
 (E) $2v_0$