

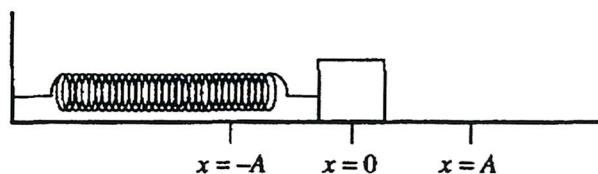
5. If  $F_1$  is the magnitude of the force exerted by the Earth on a satellite in orbit about the Earth and  $F_2$  is the magnitude of the force exerted by the satellite on the Earth, then which of the following is true?

(A)  $F_1$  is much greater than  $F_2$ .  
(B)  $F_1$  is slightly greater than  $F_2$ .  
(C)  $F_1$  is equal to  $F_2$ .  
(D)  $F_2$  is slightly greater than  $F_1$ .  
(E)  $F_2$  is much greater than  $F_1$ .

6. A ball is thrown upward. At a height of 10 meters above the ground, the ball has a potential energy of 50 joules (with the potential energy equal to zero at ground level) and is moving upward with a kinetic energy of 50 joules. Air friction is negligible. The maximum height reached by the ball is most nearly

(A) 10 m  
(B) 20 m  
(C) 30 m  
(D) 40 m  
(E) 50 m

#### Questions 7-8



A block on a horizontal frictionless plane is attached to a spring, as shown above. The block oscillates along the  $x$ -axis with simple harmonic motion of amplitude  $A$ .

7. Which of the following statements about the block is correct?

(A) At  $x = 0$ , its velocity is zero.  
(B) At  $x = 0$ , its acceleration is at a maximum.  
(C) At  $x = A$ , its displacement is at a maximum.  
(D) At  $x = A$ , its velocity is at a maximum.  
(E) At  $x = A$ , its acceleration is zero.

8. Which of the following statements about energy is correct?

(A) The potential energy of the spring is at a minimum at  $x = 0$ .  
(B) The potential energy of the spring is at a minimum at  $x = A$ .  
(C) The kinetic energy of the block is at a minimum at  $x = 0$ .  
(D) The kinetic energy of the block is at a maximum at  $x = A$ .  
(E) The kinetic energy of the block is always equal to the potential energy of the spring.