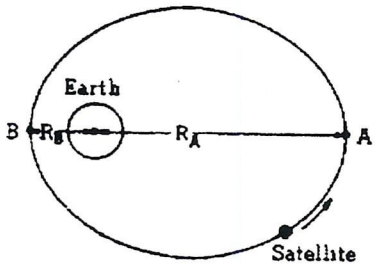
No. 27



A small satellite is in an elliptical orbit around the Earth. The distances R_A and R_B, are the maximum

and minimum distances, respectively, of the satellite from the Earth's center. Let L be the angular momentum and K the kinetic energy of the satellite. A quantity with subscript A or B denotes the instantaneous value of the quantity at the position A or B, respectively. Which of the following must he true?

(A) $L_B > L_A$ and $K_B > K_A$

(B) $L_B > L_A$ and $K_B = K_A$

(C) $L_B = L_A$ and $K_B = K_A$

(D) $L_B < L_A$ and $K_B = K_A$

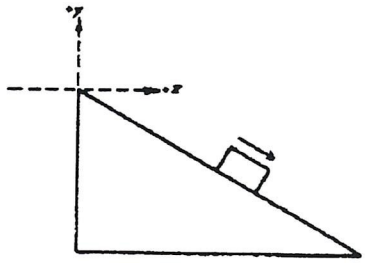
(E) $L_B = L_A$ and $K_B > K_A$

No. 28

A block attached to a spring of negligible mass undergoes simple harmonic motion on a frictionless surface, The potential energy of the system is zero at the equilibrium position and has a maximum value of 50 joules. When the displacement of the block is half the maximum value, its instantaneous kinetic energy is

(A) zero (B) 12.5 joules (C) 25 joules
(D) 37.5 joules (El 50 joules

Questions 29 - 30



A block slides down a frictionless incline as indicated in the figure above. Let y = 0, x = 0, and t = 0 just as the block is released from rest at the top of the incline. Let the positive sense for y be up and the positive sense for x be to the right.

No. 29

Which of the following graphs best represents the x component of the velocity of the block as a function of time?