Suggested problems
Chapter 05

The quiz questions will be same or very similar to the following text-book problems.
Refer to the course website for the latest version of this document.
You are encouraged to seek the help of your instructor during his office hours.

13. Figure 5-33 shows an arrangement in which four disks are suspended by cords. The longer, top cord loops over a frictionless pulley and pulls with a force of magnitude 98 N on the wall to which it is attached. The tensions in the three shorter cords are T_1 = 58.8 N, T_2 = 49.0 N, and T_3 = 9.8 N. What are the masses of (a) disk A, (b) disk B, (c) disk C, and (d) disk D?

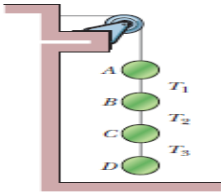

Fig. 5-33 Problem 13.

Answer: (a) 4.0 kg; (b) 1.0 kg ; (c) 4.0 kg; (d) 1.0 kg

34. In Fig. 5-40, a crate of mass m = 100 kg is pushed at constant speed up a frictionless ramp (30.0°) by a horizontal force $\vec{F}$. What are the magnitudes of (a) $\vec{F}$ and (b) the force on the crate from the ramp?

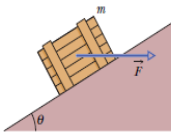

Fig. 5-40 Problem 34.

Answer: (a) 566 N; (b) 1130 N

51. Figure 5-47 shows two blocks connected by a cord (of negligible mass) that passes over a frictionless pulley (also of negligible mass). The arrangement is known as Atwood's machine. One block has mass m_1 = 1.30 kg; the other has mass m_2 = 2.80 kg.What are (a) the magnitude of the blocks' acceleration and (b) the tension in the cord?

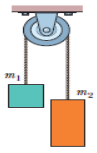

Fig. 5-47 Problems 51 and 65.

Answer: (a) 3.6 m/s^2; (b) 17 N

56. In Fig. 5-51a, a constant horizontal force $\vec{F}_a$ is applied to block A, which pushes against block B with a 20.0 N force directed horizontally to the right. In Fig. 5-51b, the same force $\vec{F}_a$ is applied to block B; now block A pushes on block B with a 10.0 N force directed horizontally to the left.The blocks have a combined mass of 12.0 kg. What are the magnitudes of (a) their acceleration in Fig. 5-51a and (b) force $\vec{F}_a$?

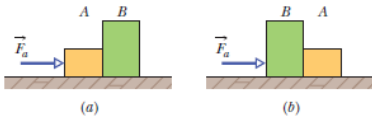

Fig. 5-51 Problem 56.

Answer: (a) 2.50 m/s^2; (b) 30.0 N

67. Figure 5-58 shows three blocks attached by cords that loop over frictionless pulleys. Block B lies on a frictionless table; the masses are m_A = 6.00 kg, m_B = 8.00 kg, and m_c = 10.0 kg. When the blocks are released, what is the tension in the cord at the right?

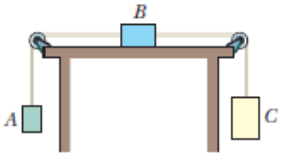

Fig. 5-58 Problem 67.

Answer: 81.7 N