Dynamic Review Questions

Multiple Choice Answers:

A. C:

1. Art in creating greater friction because the Normal is larger than Bill

2. Since \( \mathbf{v} = \text{constant} \)
   \( a = 0 \)
   \( F_{\text{net}} = 0 \)
   - only force acting on pendulum is gravity
   - hangs straight down

3. \( F_g \) is balanced out by the force of friction of the oil on the ball
   since \( v = \text{const.} \)
   \( a = 0 \)
   \( F_{\text{net}} = 0 \)
   \( \\ F_g = F_f \) !!
B. Written Response: Answer each question fully on another piece of paper.

1. Two masses of 2.0 kg and 5.0 kg are suspended by a massless cord over a frictionless pulley as shown. What are the magnitude and direction of acceleration for the 2.0 kg mass? (7 marks)

\[ a = \frac{F_{\text{net}}}{m} \]
\[ a = \frac{(5.0 \times 9.80) - (2.0 \times 9.80)}{5.0 + 2.0} \]
\[ a = \frac{49 - 19.6}{7.0} \]
\[ a = 4.2 \text{ m/s}^2 \text{ (upwards)} \]

2. Two objects are connected as shown. The 12 kg cart is on a frictionless 42° incline while the 15 kg block is on a horizontal surface having a coefficient of friction \( \mu = 0.23 \).

Determine the acceleration of the system of masses.

\[ a = \frac{F_{\text{net}}}{m_1 + m_2} = \frac{m_2 g \sin \theta - \mu m_2 g}{m_1 + m_2} \]
\[ a = \frac{(12 \times 9.80 \times \sin 42°) - 0.23 \times 15 \times 9.80}{15 + 12} \]
\[ a = \frac{78.62 N - 33.81 N}{27} = 1.7 \text{ m/s}^2 \]