**Chapter - 1**

1. **What mass of a material with density ρ is required to make a hollow spherical shell having inner radius r1 and outer radius r2?**

Solution:

1. **The position of a particle moving under uniform acceleration is some function of time and the acceleration. Suppose we write this position as x = kamtn, where k is a dimensionless constant. Show by dimensional analysis that this expression is satisfied if m=1 and n=2. Can this analysis give the value of k?**

Solution:

**Chapter - 2**

1. **A person takes a trip, driving with a constant speed of 89.5 km/h, except for a 22.0-min rest stop. If the person’s average speed is 77.8 km/h, (a) how much time is spent on the trip and (b) how far does the person travel?**

Solution:

1. **An electron in a cathode-ray tube accelerates uniformly from 2.00 × 104 m/s to 6.00 × 106 m/s over 1.50 cm. (a) In what time interval does the electron travel this 1.50 cm? (b) What is its acceleration?**

Solution:

**Chapter - 3**

1. **A force** **of magnitude 6.00 units acts on an object at the origin in a direction *Ɵ* = 30.0° above the positive x axis (Fig. P3.7). A second force**  **of magnitude 5.00 units acts on the object in the direction of the positive y axis. Find graphically the magnitude and direction of the resultant force** .

Solution:

1. **Given the displacement vectors** $\vec{A}$ **= (3î - 4ĵ + 4k̂) m and** $\vec{B}$ **= (2î + 3ĵ - 7k̂) m, find the magnitudes of the following vectors and express each in terms of its rectangular components. (a)** $\vec{C}=\vec{A}+\vec{B}$ **(b)** $\vec{D}=2\vec{A}-\vec{B}$

Solution:

**Chapter - 4**

1. **A projectile is fired in such a way that its horizontal range is equal to three times its maximum height. What is the angle of projection?**

Solution:

1. **The pilot of an airplane notes that the compass indicates a heading due west. The airplane’s speed relative to the air is 150 km/h. The air is moving in a wind at 30.0 km/h toward the north. Find the velocity of the airplane relative to the ground.**

Solution:

**Chapter - 5**

1. **A 3.00-kg object undergoes an acceleration given by**  **Find (a) the resultant force acting on the object and (b) the magnitude of the resultant force.**

Solution:

1. **If a man weighs 900 N on the Earth, what would he weigh on Jupiter, where the free-fall acceleration is 25.9 m/s2?**

Solution:

**Chapter - 6**

1. **In the Bohr model of the hydrogen atom, an electron moves in a circular path around a proton. The speed of the electron is approximately 2.20 × 106 m/s. Find (a) the force acting on the electron as it revolves in a circular orbit of radius 0.529 × 10-10 m and (b) the centripetal acceleration of the electron.**

Solution:

1. **A hawk flies in a horizontal arc of radius 12.0 m at constant speed 4.00 m/s. (a) Find its centripetal acceleration. (b) It continues to fly along the same horizontal arc, but increases its speed at the rate of 1.20 m/s2. Find the acceleration (magnitude and direction) in this situation at the moment the hawk’s speed is 4.00 m/s.**

Solution: