**Answer on Question #44708 – Physics - Mechanics | Kinematics | Dynamics**

Q.1 A car possesses 20000 of Momentum.what would be the car's new momentum if...
A. it's velocity is doubled
B.it's velocity is tripled
C. it mass were doubled(by adding one or more passenger)
D.Both it's velocity and mass were doubled
E.it's velocity were doubled and mass were halved

Q.2 A brick of mass is 0.8 Kg is accidentally dropped from a high scaffolding.It reaches the ground with a kinetic energy of 240 J. How high is the scaffolding

Q.3 A person drops a stone down a water well and hear a splash 2 s after it leaves his hand.What is the depth of well

Q.4 The average speed of a car is 35 Km/h. how far it can travel in 45 min?

Q.5 The ball is thrown vertically upward at 20 m/s
a)how high it goes?
b)the time taken to reach this height?
c)the time taken to return to its starting point?

Q.6 Supposing you were in a weightless environment,would it require a force to set an object in motion
THANK YOU

Solution:

**Q1**

$$\mathrm{p} = \mathrm{m} \cdot \mathrm{v} = 20 \times 10^3 - \text{initial momentum of the car;}$$

A. $\mathrm{p_A} = \mathrm{m} \cdot 2\mathrm{v} = 2\mathrm{p} = 40 \times 10^3 -$ final momentum if car's velocity is doubled;
B. $\mathrm{p_B} = \mathrm{m} \cdot 3\mathrm{v} = 3\mathrm{p} = 60 \times 10^3 -$ final momentum if car's velocity is tripled;
C. $\mathrm{p_C} = 2\mathrm{m} \cdot \mathrm{v} = 2\mathrm{p} = 40 \times 10^3 -$ final momentum if car's mass is doubled
D. $\mathrm{p_D} = 2\mathrm{m} \cdot 2\mathrm{v} = 4\mathrm{p} = 80 \times 10^3 -$ final momentum if car's mass and velocity are doubled

**Q2**

$\mathrm{m} = 0.8\ \mathrm{kg} -$ mass of the object;
$\mathrm{KE} = 240\ \mathrm{J} -$ final kinetic energy of the body;
$\mathrm{h} -$ high of the scaffolding
Law of conservation of energy

$$\mathrm{PE} = \mathrm{KE}$$
$$\mathrm{mgh} = \mathrm{KE}$$

$$\mathrm{h} = \frac{\mathrm{KE}}{\mathrm{mg}} = \frac{240\ \mathrm{J}}{0.8\ \mathrm{kg}\ \cdot 9.8\frac{\mathrm{N}}{\mathrm{kg}}} = 30.6\ \mathrm{m}$$

**Answer:** height of the scaffolding is $30.6\ \mathrm{m}$.

**Q3**

$\mathrm{t} = 2\mathrm{s} - \text{time of traveling};$
$\mathrm{h}$ –depth of well
Equation of motion along Y-axis (vertical)

$$\mathrm{y}: \mathrm{h} = \frac{\mathrm{gt}^2}{2} = \frac{9.8\frac{\mathrm{m}}{\mathrm{s}^2} \cdot (2\mathrm{s})^2}{2} = 19.6\ \mathrm{m}$$

Answer: depth of well is $19.6\ \mathrm{m}$.

**Q4**

$$\mathrm{V} = 45\frac{km}{h} - average\ speed\ of\ the\ car;$$
$$t = 45\,min = 0.75\ hour - time\ of\ traveling;$$
$$S - travelled\ distance;$$

Equation of motion of the car along X-axis (horizontal)

$$x: S = V \cdot t = 45\frac{km}{h} \cdot 0.75\ hour = 33.7\ km$$

Answer: travelled distance is equal to $33.7\ km$.

**Q5**

$V = 20\frac{m}{s} - initial\ vecocity\ of\ the\ ball;$

b) rate equation for the ball (final velocity of the ball is zero):

$$0 = V - gt$$
$$t = \frac{V}{g} = \frac{20\frac{m}{s}}{9.8\frac{m}{s^2}} = 2\ s$$

c) the time taken to return to its starting point is twice the time to reach maximum height

$$T = 2 \cdot t = 4\ s$$

a) Equation of motion along Y-axis (vertical):

$$y: h = Vt - \frac{gt^2}{2} = \frac{V^2}{g} - \frac{V^2}{2g} = \frac{V^2}{2g} = \frac{\left(20\frac{m}{s}\right)^2}{2 \cdot 9.8\frac{m}{s^2}} = 20.4\ m$$

**Answer:** a) 20.4 m
b) 2 s
c) 4s

**Q6**

Even in space objects have mass. And if they have mass, they have inertia. That is, an object in space resists changes in its state of motion. A force must be applied to set a stationary object in motion. Newton's laws rule - everywhere!