Good Morning Students!

Today we will be doing the remaining ---- Numericals of Exercise-2 C. You all are required to open Page Number-54 of your Physics Textbook, titled-'Concise Physics by Selina Publications' and also open your notebook to do the numericals alongwith.

## EXERCISE-2 C NUMERICALS

**11.** $u = 0$ m/s (body is starting from rest)
Distance travelled = 270 m Time = 3s
Using the second Equation of Motion:

$$s = ut + \frac{1}{2}at^2$$

$$270 = 0 + \frac{1}{2} \times a \times 3^2$$

$$270 = \frac{9}{2}a$$

$$60 \text{ m/s}^2 = a \qquad a = 60 \text{ m/s}^2$$

Using the first equation of motion:

$$v = u + at$$
$$v = 0 + 60 \times 10$$
$$v = 600 \text{ m/s}$$

**12.** Using Second Equation of Motion:

$$s = ut + \frac{1}{2}at^2$$

CASE-1

$$3 = u \times 1 + \frac{1}{2}a \times 1$$

$$3 = u + \frac{1}{2}a$$

So, $u = 3 - \frac{1}{2}a$ ——— (1)

CHAPTER-2 MOTION IN ONE DIMENSION

**CASE-2 :** Using second equation of motion:

$$s = ut + \frac{1}{2}at^2$$

$$8 = 2u + \frac{1}{2}a \times 2 \times 2$$

$$8 = 2u + 2a$$

$$8 = 2(u + a)$$

$$4 = u + a$$

$$u = 4 - a \quad \text{— (2)}$$

Equating (1) and (2) :

$$3 - \frac{1}{2}a = 4 - a$$

$$3 - 4 = -a + \frac{1}{2}a$$

$$-1 = \frac{-2a + a}{2} = -\frac{a}{2}$$

So, $\not{-}\frac{a}{2} = \not{-}1$ $\qquad a = 2\,m/s^2$

Putting this value of 'a' in equation (2) :

$u = 4 - a = 2$ $\qquad u = 2\,m/s$

(You all are required to take a break for 10 minutes and in the meantime you are required to go through example-5 given on Page Number-53 in your Physics textbook).

**13.** $u = 25\,m/s$ $\qquad t = 5s$ (before brakes)

i) So, uniform velocity means, $a = 0\,m/s^2$

Using second equation of motion :

$$s = ut + \frac{1}{2}at^2$$

$$s = 25 \times 5 = 125\,m$$

$s = 125\,m$ (distance travelled before brakes were applied)

ii) (Brakes are applied and the car comes to rest in next 10 s. So, when we have to find retardation, we will take time = 10 s).
Using First equation of motion:

$$v = u + at$$
$$0 = 25 + a \times 10$$
$$-25 = 10a \qquad a = -2.5\ m/s^2$$

Thus, Retardation = $2.5\ m/s^2$

iii) $s = ?$ $\quad t = 10\ s$ $\quad a = -2.5\ m/s^2$
Using Second Equation of motion:

$$s = ut + \frac{1}{2}at^2$$
$$s = 25 \times 10 + \frac{1}{2}(-2.5) \times 100^{50}$$
$$= 250 - 125$$
$$s = 125\ m$$

(Now Students, kindly open Page Number - 53 and read example number - 7. Take a 5 minutes break and try to solve this example in your notebook.)
You may resume further to understand the method used.

EXAMPLE - 7 $\quad u = 0\ m/s$.
For, $t = 5\ s$ $\quad a = 5\ m/s^2$
i) Distance travelled in $t = 4\ s$,
Using Second Equation of motion:

$$s = ut + \frac{1}{2}at^2$$
$$s = 0 \times 4 + \frac{1}{2} \times 5 \times 4^2 \times 4$$
$$s = 40\ m \qquad \text{— (1)}$$