

CLASS-VIII

SUBJECT- PHYSICS

CHAPTER-2

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Good morning Students!

Today we will be doing remaining numericals of Exercise-2(A). You all are required to open page number-36 of your Physics textbook, titled - 'Concise Physics by Selina Publications'. Kindly open your Physics notebook also to do the numericals.

NUMERICALS OF EXERCISE-2(A)

$$12) u = 18 \text{ km/h} = 18 \times \frac{5}{18} \text{ m/s} = 5 \text{ m/s}$$

$$v = 0 \text{ m/s (as toy car comes to stop)}, t = 2 \text{ s}$$

$$\text{Using, } a = \frac{v - u}{t}, \quad a = \frac{0 - 5}{2}$$

$$a = -\frac{5}{2} \text{ m/s}^2 = -2.5 \text{ m/s}^2$$

$$\text{So, Retardation} = \underline{2.5 \text{ m/s}^2}$$

$$13) a = 5 \text{ m/s}^2, \quad t = 2 \text{ s}$$

$$a = \frac{\text{change in velocity}}{\text{in time}}$$

$$\text{change in velocity, } = 5 \times 2 = 10 \text{ m/s}$$

$$15) u = 5 \text{ m/s} \quad a = 2 \text{ m/s}^2 \quad t = 5 \text{ s} \quad v = ?$$

$$a = \frac{v - u}{t}$$

$$2 = \frac{v - 5}{5}, \quad 10 = v - 5$$

$$\text{So, } v = 10 + 5 = 15 \text{ m/s} \quad v = 15 \text{ m/s}$$

16) i)  $u = 18 \text{ km/h} = 18 \times \frac{5}{18} \text{ m/s} = 5 \text{ m/s}$

$v = 0 \text{ m/s}, t = 5 \text{ s}$

ii)  $a = \frac{v - u}{t} = \frac{0 - 5}{5} = -\frac{5}{5} = -1 \text{ m/s}^2$

Retardation =  $1 \text{ m/s}^2$

iii)  $v = ?$   $t = 2 \text{ s}$

$a = \frac{v - u}{t}$  (we have to find final velocity after  $t = 2$  seconds).

$-1 = \frac{v - 5}{2}$

$-2 + 5 = v$

$v = 3 \text{ m/s}$

### IMPORTANT EXAMPLES (Page Number-34)

EXAMPLE-6 → A train first travels for 30 min. with a velocity 30 km/h and then for 40 min. with a velocity 40 km/h in the same direction. Calculate:

- the total distance travelled,
- the average velocity of the train.

SOLUTION:

CASE-I  $t_1 = 30 \text{ min.} = \frac{30}{60} \text{ h} = \frac{1}{2} \text{ h}$

Distance = Speed  $\times$  time =  $30 \text{ km/h} \times \frac{1}{2} \text{ h} = 15 \text{ km}$

CASE-II  $t_2 = 40 \text{ min.} = \frac{40}{60} \text{ h} = \frac{2}{3} \text{ h}$

Distance =  $40 \times \frac{2}{3} = \frac{80}{3} \text{ km}$

i) Total Distance travelled =  $(15 + \frac{80}{3}) \text{ km} = \frac{125}{3} \text{ km}$

ii) Total time taken =  $t_1 + t_2 = (\frac{1}{2} + \frac{2}{3}) \text{ h} = \frac{7}{6} \text{ h}$

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$$\begin{aligned} \text{Average Velocity} &= \frac{\text{Total distance travelled}}{\text{Total time taken}} \\ &= \frac{125}{3} \div \frac{7}{6} \end{aligned}$$

$$\text{Average Velocity} = \frac{125}{3} \times \frac{6}{7} = 35.71 \text{ km/h}$$

Students, now you may all take a break and do example-7 and example-10 yourself.

## EQUATIONS OF MOTION

There are three equations of motion :

1) First equation of motion :  $v = u + at$

2) Second equation of motion :  $s = ut + \frac{1}{2}at^2$

3) Third equation of motion :  $v^2 - u^2 = 2as$

where,  $v$  = final velocity,  $u$  = initial velocity  
 $s$  = distance travelled,  
 $a$  = acceleration,  $t$  = time taken

## NUMERICALS OF EXERCISE-2(c)

1)  $u = 0 \text{ m/s}$        $a = 2 \text{ m/s}^2$        $s = ?$        $t = 2 \text{ s}$

Using II equation of motion :

$$s = ut + \frac{1}{2}at^2 = 0 \times 2 + \frac{1}{2} \times 2 \times 2^2$$

$$\underline{s = 4 \text{ m}}$$

2) Try yourself

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With this, I am ending today's interactive session and you all are required to complete Numericals - 2(A) in your Physics notebook and also try tick marked numericals of Exercise-2(C).

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