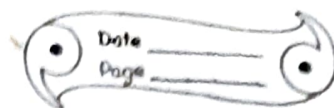


CW
25/6/21

Motion



C. Numericals :-

2. A car covers a distance of 160 km between two cities in four 4 h. What is the average speed of the car?

ans- Distance = 160 km

Time travelled = 4 h taken = 4 h

$$\text{Average speed} = \frac{\text{Total distance travelled}}{\text{Total time take}}$$

$$= \frac{160}{4} = 40 \text{ km h}^{-1}$$

2. A train travels a distance of 300 km with an average speed of 60 km h^{-1} . How much time does it take to cover the distance?

ans- Distance covered by train = 300 km

Average speed of train = 60 km h^{-1}

$$\text{Time taken by train} = \frac{\text{Distance covered}}{\text{Speed}}$$

$$= \frac{3000}{600} 5$$

$$= 5h$$

∴ Time taken is 5 hours.

3) A boy travels with an average speed of 10 m s^{-1} for 20 min. How much distance does he travel

ans - Distance = speed \times time

$$= 10 \text{ m s}^{-1} \times 20 \text{ min}$$
$$= 10 \times 1200$$
$$= 12000 \text{ m}$$
$$= 12 \text{ km}$$

4) A boy walks a distance of 30 m in 1 min and another 30 m in 1.5 min. Describe the type of motion of the boy and find his average speed in m s^{-1} .

ans - It is ~~an~~ a non-uniform because it travels equal distances in unequal ~~distan~~ intervals of time.

$$= \text{Average speed} = \frac{\text{Total Lin Distance travelled}}{\text{Total time taken}}$$

$$= \frac{30+30}{1+1.5} = \frac{60}{1.5} = 0.4 \text{ m s}^{-1}$$

5.) A cyclist travels a distance of 1km in the first hour, 0.5 km in the second hour and 0.3 km in the third hour. Find the average speed of the cyclist in i.) km h^{-1} ii.) m s^{-1}

ans.) i.) Average speed = $\frac{1\text{km} + 0.5\text{km} + 0.3\text{km}}{1\text{h} + 1\text{h} + 1\text{h}}$

$$= \frac{1.8}{3} = 0.6 \text{ km h}^{-1}$$

ii.) Average speed = $\frac{1000\text{m} + 500\text{m} + 300\text{m}}{1800}$

$$= \frac{1800}{10800} = 0.167 \text{ m s}^{-1}$$

6.) A car travels with a speed 30 km h^{-1} for 30 minutes and then with a speed of 40 km h^{-1} for one hour

Find :-

- a.) total distance travelled by car
- b.) the total time of time travel
- c.) the average speed of car

ans - a.) speed of car for 30 min = 30 km h^{-1}
speed for one hour = 40 km h^{-1}

$$\text{Speed} \times \text{Distance} = \text{Speed} \times \text{time}$$

$$= 30 \times 0.5 \quad (\text{As } 30 \text{ min is half an hour})$$
$$= 15 \text{ km}$$

b.) Speed = 40 km h^{-1}

Distance = 40 km

$$\text{Total distance} = 40 + 15 = 55 \text{ km}$$

b.) Total time of travel = $1 \text{ h} + 0.5 \text{ h} = 1.5 \text{ h}$

c.) Average speed = $\frac{\text{Total distance travelled}}{\text{Total time travelled}}$

$$= 55 \text{ km} / 1.5 \text{ h}$$
$$= 36.67 \text{ km h}^{-1}$$

7.) On Earth the weight of a body of mass 1.0 kg is 10 N. What will be the weight of a boy of mass 37 kg in i.) kgf ii.) N ?

ans- 37 kg into kgf

$$= 1 \text{ kg} = 1 \text{ kgf}$$

$$\text{So, } 37 \text{ kg} = 37 \text{ kgf}$$

37 kg into N (newton)

$$= 1 \text{ kgf} = 10 \text{ N}$$

$$\text{So, } 37 \text{ kgf} = 37 \times 10 = 370 \text{ N}$$

8.) The weight of a body mass 6.0 kg¹ is 10 N. on moon
If a boy of mass 30 kg goes from Earth to the moon surface, what will be his
a.) mass, b.) weight ?

ans- a.) Mass remains the same

Mass of boy 30 kg on Earth = 30 kg on moon.

b) Weight of boy on moon becomes $\frac{1}{6}$
30 kg boy will weigh = $30 \times \frac{1}{6} = 5 \text{ kg}$

$$1 \text{ kg} = 10 \text{ N}$$

$$5 \text{ kg} = 5 \times 10 = 50 \text{ N}$$

Weight of the boy on moon is 50 N.