Average Speed

Average Speed = $\frac{\text{Total distance}}{\text{Total Time}}$

$= \frac{60+80}{1+2} \quad \frac{60+80}{2}$

$= \frac{140}{3} \quad \frac{140}{2} = 70 \text{ km/h}$

A bus travels first 240 km with a speed of 80 km/hr. It covers next 360 km at speed of 90 km/hr. Find its average speed.

1st Time = $\frac{240}{80} = 3 \text{ hrs}$

2nd Time = $\frac{360}{90} = 4 \text{ hr}$

Average Speed = $\frac{240+360}{3+4} = \frac{600}{7}$

$= 85.7 \text{ km/hr}$

(BSP)

Ans) Convert :-

1 km = 1000 m

1 hr = 60 mins = 3600 sec.

$\therefore \frac{1 \text{ km}}{\text{h}} = \frac{1000 \text{ m}}{3600 \text{ s}}$

$\therefore 1 \text{ km/h} = \frac{5}{18} \text{ m/s}$

Case 1 :-

Initial velocity = 52 km/hr

$= 52 \times \frac{5}{18} = \frac{130}{9}$

1 3 0
2 6 0
18 9 9

Final Velocity = 0 ~~km~~ m/sec

Time = 5 second

So, Distance travelled

$= \frac{1}{2} \times b \times h$

$= \frac{1}{2} \times 5 \times \frac{130}{9}^{65} = \frac{325}{9} \text{ m}$

Q:) An athelte completes one round of a circular track of diameter is 200m in 40 sec. What will be the distance covered and displacement at the end of 2min 20 sec?

Ans) Time = 140 sec

No. of rounds complete by the athelete = $\frac{140}{40} = 3$

∴ the distance covered in 140 sec

$= 2\pi r \times 3.5$

$= 2 \times \frac{22}{7} \times 100 \times \frac{3}{2} = 2200\,m$

Q:)

Ans:) Initial Velocity $= u = 0$

Acceleration $= a = 3ms^{-2}$

Time $(t) = 8$ sec

Using second equation of motion:-

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

$S = 0 \times 8 + \frac{1}{2} \times 3 \times 8^2$

$= 96m$

Q67

Ans) a:- Speed = $\frac{\text{Distance}}{\text{Time}}$

Q; A travels from 6 to 12 km in
B travels from 0 to 12 km in 1.4
C travels from 2 to 12 km in 1

∴ B travels the most distance.

b:- NO, all the three never met at the same point on the road.

Q7:)
Ans:) Initial Velocity $= (u) = 0$
Distance or height of fall $= 20\,m$
Acceleration $= 10\,m/s^2$

$\Rightarrow 2as = v^2 - u^2$

$\Rightarrow v^2 = 2as + u^2$

$\Rightarrow v^2 = (2 \times 10 \times 20) + 0$

$\Rightarrow v^2 = 400$

∴ Final velocity of ball $(v) = 20\,ms^{-1}$

$t = \dfrac{(v-u)}{a}$

∴ Time taken by the ball to strike $= \dfrac{20 - 0}{10} = \dfrac{20}{10} = 2$ sec

∴ the time it takes to strike the ground is 2 sec.

Q.7)

Ans:) a:) It can be possible.
When a body is thrown vertically upward in space, then at the highest point, the body has zero velocity but the acceleration of the body will be equal to the acceleration due to gravity

b:) It can be possible

A body moving horizontally with an acceleration in vertical direction is possible in a projectile motion.

c:) It can be possible.
For example; in a circular motion if one is moving with a constant speed, the motion is still said to be accelerated motion as the direction of velocity changes at every point of the path.

Q10)

Ans) Radius = 42250 km

Time = 24 hr

Distance travelled = $2\pi r$

$= 2 \times \frac{22}{7} \times 42250$

$= 265571.43$ km

$\therefore$ Speed = $\frac{\text{Distance}}{\text{Time}}$

$= \frac{265571.43}{24} =$

$= 11065.47$ km/hr.