(6) Fig 8.11 shows the distance - time graph of three objects A, B, C. Study the graph and answer the following questions.

(a) Which of the three is travelling the fastest?

⇒ B

(b) Are all three ever at the same point on the road?

⇒ NO

) How far has (travelled when B passes A?

96 km

(d) How far has B travelled by the time it passes C?

⇒ 4 [illegible] further.

(7) A ball is gently dropped from the height of 20 m. If its velocity increases uniformly at the rate of $10 ms^{-2}$, with what velocity will it strike the ground? After what time will it strike the ground?

⇒ $U = 0 m/s$, $S = 20m$, $a = 10 ms^{-2}$, $v = ?$, $t = ?$

Using $v^2 = u^2 = 2as$

$v^2 - 0^2 = 2 \times 10 \times 20 = 400 \Rightarrow v = 20 ms^{-1}$

$t = (v-u) \div a = 20 \div 10 = 2s$.

(8) The speed - time graph for a car is shown is fig 8.12.

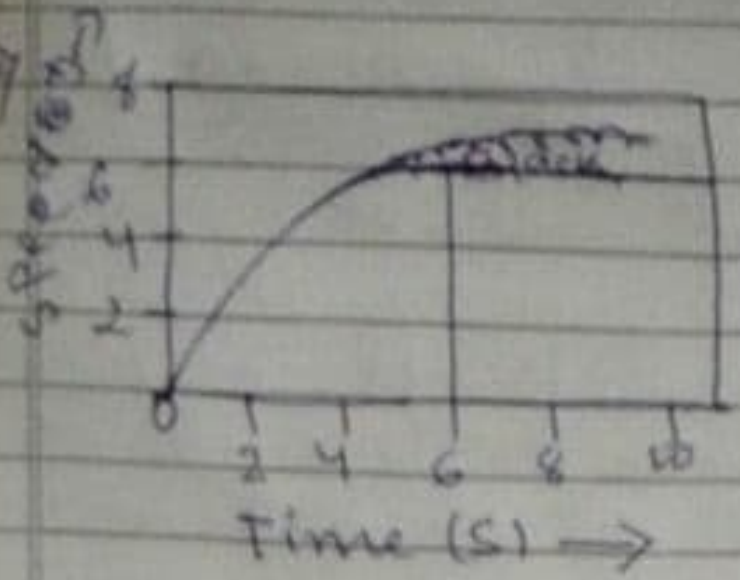

fig 8.12

a) Find how far does the car travel in the first 4 seconds. Shade the area on the graph that represents the distance travelled by the car during the period.

⇒ 6(ms⁻¹)

(b) Which part of the graph represents uniform motion of the car?

⇒ The black part of the line represent Uniform motion of the car

(a) State which of the following situations are possible and give an example for each of these:

a) an object with a constant acceleration but with zero velocity.

⇒ It is possible for an object to have constant acceleration but zero velocity. If a body is projected vertically upward, at the position of its maximum height, its velocity will be zero. But it will experience acceleration due to gravity.

(b) an object moving with an acceleration but with uniform speed

⇒ It is possible for an object moving in a certain direction with acceleration in the perpendicular direction. If a body is undergoing uniform circular motion, it has an acceleration that is directed toward

the centre of its circular path. At any given point of time its direction of motion and its acceleration are perpendicular to each other.

b) An artificial satellite is moving in a circular orbit of radius 42250 Km. Calculate its speed if it takes 24 hrs to revolve around the earth.

R = 42250 km = 42250000 m
T = 24 h = 24 x 60 x 60s.

Using · Speed, V = 2πR ÷ T

V = (2 x 3.14 x 42250000) ÷ (24 x 60 x 60) m/s

⇒ 3070.9 m/s = 3.07 kms.

14 Time = 2 min 20 sec = 140 sec.
Radius = r = 100 m

140 sec the athlete complete one round.

In 14 sec the athlete will complete = 140 ÷ 40 = 3.5 round.

Distance covered in 140 sec
= 2πr x 3.5 = 2 x 22/7 x 100 x 3.5
= 2200m

Displacement = diameter = 200m

a) Distance covered for motion A to B
⇒ 300 m

Displacement = 300 m

Time taken = 150 sec

Average Speed = 300 m ÷ 150 sec = 2m

Average velocity = 300m ÷ 150 s = 2m

b) For motion from A to C

Distance covered = 300 + 100 = 4

Displacement = AB - CB = 300 - 100 =

Time taken = 2·5 mins = 210 sec.

Average Speed = 400 ÷ 210 = 1·90 ms^{-1}

Average velocity = 200m ÷ 210sec = 0·952 ms^{-1}

Let one side distance = x km

Time taken for forward at a speed of 20 km/h = Distance / speed = x/20 h.

return at a Speed of 30 km/h = x/30 hr.

Total time = $\frac{x}{20} + \frac{x}{30} = \frac{3x+2x}{60}$

$\frac{5x}{60}$ h.

Total distance covered = 2x km

Average speed = Total distance ÷ Total time = 2x ÷ (5x/60) = 24 kmh

4) $u = 0 m/s$

$a = 3m^{s-2}$

$t = 8s$

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

$\rightarrow 0 \times 8 + 1/2 \times 3 \times 8^2 = 96 m.$

First performing to rest]

(5) Area of traingle AOB

$= \frac{1}{2} \times AO \times BO$

$= \frac{1}{2} \times 52 kmh^{-1} \times 5 s$

$= \frac{1}{2} \times (52 \times 1000 \times 1/3600) ms^{-1} \times 5 s = 36.1 m$

Second Before coming to rest
Area of traingle COD

$= \frac{1}{2} \times CO \times DO$

$\frac{1}{2} \times 34 kmh^{-1} \times 10 s$

$= 1/2 \times [34 \times 1000 \times 1/3600] ms^{-1} \times 10 s = 47.$

The second travels farther tha