PHYSICS

BOOKS - CAMBRIDGE PHYSICS (KANNADA ENGLISH)

MOTION

Question Hour

1. An object has moved through a distance can it have zero displace ment? If yes, support

your answer with an example.

2. A farmer moves along the boundry of a square field of side 10M in 40s. What will be the magnitude of displacement of the farmer at the end of 2 minutes 20 seconds from his initial position?

3. Which of the following is true for displacement ?

It cannot be zero

(b) Its magnitude is greater than the distance travelled by the object.

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4. Distinguish between speed and velocity

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5. Under what conditions is the magnitude of average velocity of an object equal to its average speed?

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6. What does the odometer of an automobile measure?

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7. What does the path of an object look like when it is in uniform motion?

8. During an experiment a signal from a spaceship reached the ground station in five minutes. What was the distance of the spaceship from the ground station? The signal travels at the speed of light, that is, $3 \times 10^8 m/s$

9. When will you say a body is in

(i) Uniform acceleration

(ii) Non-uniform acceleration

10. A bus decreases its speed from 80 km/h to 60 km/h in 5s. Find the acceleration of the bus.

11. A train starting from a railways station and moving with uniform acceleration attains a speed 40 km/h in 10 minutes. Find its acceleration.

12. What is the nature of the distance time graphs for uniform and non uniform motion of an object?

13. What can you say about the motion of an object whose distance -time graph is straight line parallel to the time axis?

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14. What can you say about the motion of the object if its speed-time graph is a straight line parallel to the time axis.

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15. What is the quantity which is measured by the area occupied below the velocity-time graph.

16. A bus starting from rest moves with a uniform acceleration of $0.1m/s^2$ for 2 minutes. Find

(a) The speed acqquired

(b) The distance travelled

17. A train is travelling at the speed of 90km/h. Brakes are applied so as to produce a uniform acceleration of 0.5m/s^2. Find how far the train will go before it is brought to rest.

18. A trolley, while going down an inclined plane, has an acceleration of $2cm/s^2$. What will be its velocity 3s after the start ?

19. A racing car has a uniform acceleration of $4m/s^2$. What distance will it cover in 10s after start ?

20. A stone is thrown in a vertically upward direction with a velocity of 5m/s. If the acceleration of the stone during its motion is

$10m/s^2$ in the downward direction, what will be the height attained by the stone and how much time will it take to reach there?

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1. An athlete completes one round of a circular track of diameter 200 m in 40 s. What will be the distance covered and displacement at the end of 2 minutes 20 s?

2. Joseph jogs from end A to the other B of a straight 300m road in 2min 30 sec and then turn around and jogs 100m back to point c in another 1 minute. What are Joseph's average speeds and velocities in jogging (a) from A to B and (b) from A to C ?

3. Abdul, while driving to school, computes the average speed for his trip to be $20 kmh^{-1}$ on his return trip along the same route, there is less traffic and the average speed is $40 kmh^{-1}$. What is the average speed for Abdul's trip?

4. A motorboat starting from rest on a lake accelerates in a straight line at a constant rate

of $3.0 ms^{-2}$ for 8.0s. How far does the boat travel during this time?

5. A driver of a car travelling at 52 km h^{-1} applies the brakes and accelerates uniformly in the opposite direction. The car stopped in 5 s. Another driver going at 3 km h^{-1} in another car applies his brakes slowly and stops in 10 s. On the same graph paper plot the speed versus time graphs for the two cars. Which the

two cars travelled farther after the brakes were applied?

6. Fig. shows the distance-time graph of three objects A, B and C. Study the graph and answer the following questions:
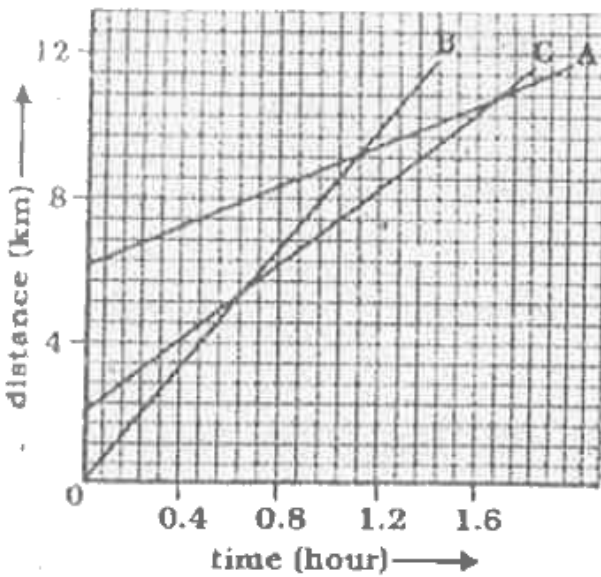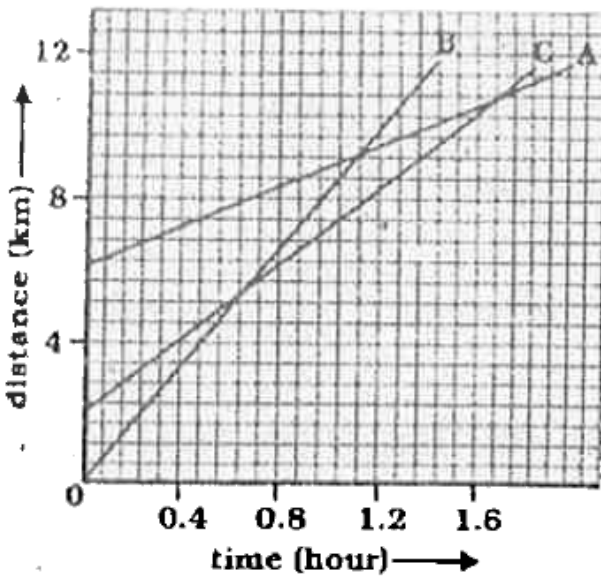
Which of the three is travelling the fastest?

7. Fig. shows the distance-time graph of three objects A, B and C. Study the graph and answer the following questions:
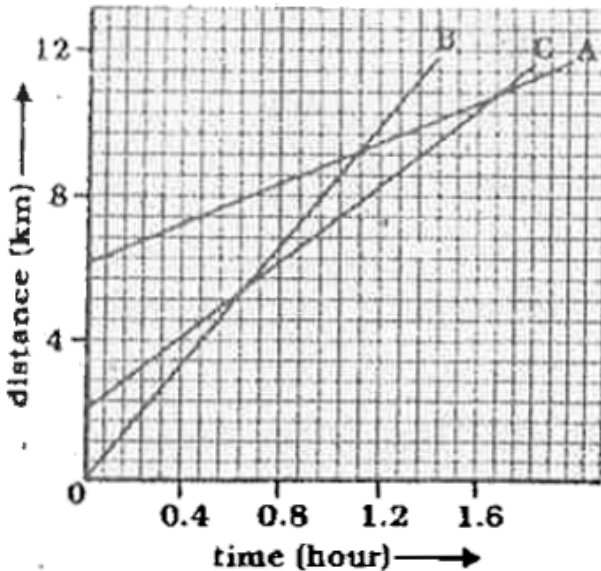
Are all three ever at the same point on the road?

8. Fig. shows the distance-time graph of three objects A, B and C. Study the graph and

answer the following questions:

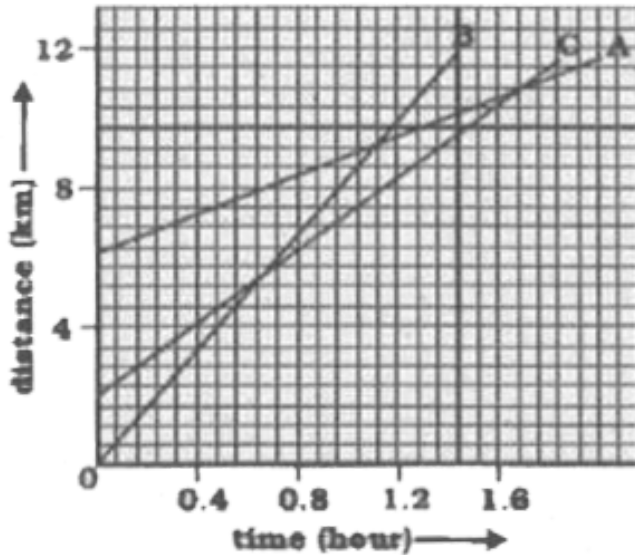How far has C travelled when B passes A?

9. Figure shows the distance time graph fo

three objects A,B and C. Study the graph and

answer the following questions:-

How far has B traveled by the time it passes C
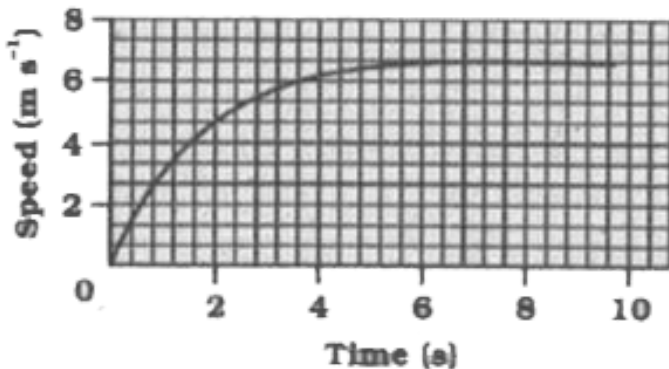
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10. A ball is gently dropped from height of

20m. If its velocity increases uniformly at the

rate of $10ms^{-2}$, with what velocity will it strike the ground? After what time will it strike the ground.

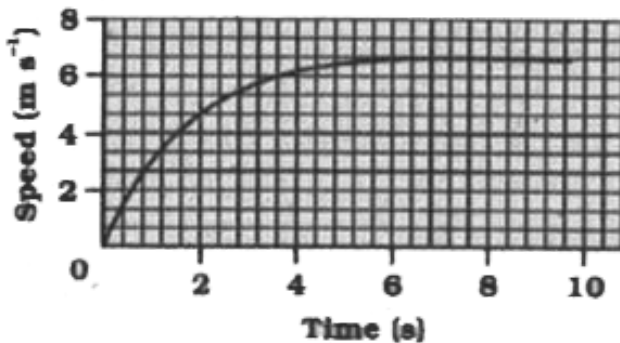**11.** The speed time graph for a car is shown in fig 8.12

Find out how far the car travels in the first 4

seconds. Shade the area on the graph that represents the distance travelled by the car during the period.

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12. The speed time graph for a car is shown in fig 8.12

Which part of the graph represents uniform motion of the car?

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13. State which of the following situation are possible and give an example for each of these

An object with a constant acceleration but with zero velcoity

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14. State which of the following situation are possible and give an example for each of these An object moving in a certain direction with an acceleration in the perpendi cular direction.

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

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1. A train is running at a speed of 72km/h. It crosses a bridge of length half kilometer in 1 min. Calculate the length of the train.

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2. Mathematically prove that the distance (S) travelled by an object is the average mean of initial velocity (u) and final velocity (v) having

constant acceleration (a) in the direction of motion in a straight line.

3. A racing car has a uniform acceleration of $4m/s^2$. What distance will it cover in 10s after start ?

4. Distinguish between speed and velocity.

5. Outline the difference between scalars and vectors physical quantities.

6. What does the odometer of an automobile measure?

7. When will you say a body is in

(i) Uniform acceleration

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9. A ball is thrown upwards and it goes to the height 100m and comes down.

(1) What is the net displacement?

(2) What is the net distance?

10. What happens to speed, velocity, acceleration when an object moves in a circle with uniform speed?

11. Match the following

A	B
1) Average speed	a) $v = u + at$
2) Average velocity	b) $S = ut + 1/2\ at^2$
3) Average acceleration	c) $S = \dfrac{d}{t}$
4) Relation between velocity acc/n, displacement	d) $V = \dfrac{D}{t}$
5) Relation between velocity and acceleration time	e) $a = \dfrac{\Delta V}{t}$

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Unit Test

1. SI unit of acceleration is _____

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2. If an object starts from 'A' and comes back to

'A', its displacement will be_____

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3. Distinguish between speed and velocity.

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