ESSENCE TEST-5

DATE : 11-08-19

9TH CLASS
ICSE

MOTION IN ONE D

Mantra to get the best outcome.....

Best solution

IIT-JEE + NEET + KVPY + OLYMPIAD + NTSE

MARKS : 80 **PHYSICS** **TIME : 3 HR.**

1. Multiple choice type question: **[1×10=10]**

(i) The vector quantity is:

(a) work (b) pressure (c) distance (d) velocity

(ii) The S.I. unit of velocity is:

(a) km h^{-1} (b) m min^{-1} (c) km min^{-1} (d) m s^{-1}

(iii) The unit of retardation is :

(a) m s^{-1} (b) m s^{-2} (c) m (d) m s^2

(iv) A body when projected up with an initial velocity u goes to a height h in time t and then comes back at the point of projection. The correct statement is:

(a) the average velocity is 2h/t (b) the acceleration is zero

(c) the final velocity on reaching the point of projection is 2u

(d) the displacement is zero

(v) 18 km h^{-1} is equal to:

(a) 10 m s^{-1} (b) 5 m s^{-1} (c) 18 m s^{-1} (d) 1·8 m s^{-1}

(vi) The correct equation of motion is:

(a) v = u + aS (b) v = ut + a (c) $S = ut + \frac{1}{2}$ at (d) v = u + at

(vii) A car starting from rest accelerates uniformly to acquire a speed 20 km h^{-1} in 30 min. The distance travelled by car in this time interval will be:

(a) 600 km (b) 5 km (c) 6 km (d) 10 km

(viii) The velocity-time graph of a body in motion is a straight line inclined to the time axis. The correct statement is:

(a) velocity is uniform (b) acceleration is uniform

(c) both velocity and acceleration are uniform

(d) neither velocity nor acceleration is uniform

(ix) For uniform motion:

(a) the distance -time graph is a straight line parallel to the time axis.

(b) the speed-time graph is a straight line inclined to the time axis.

(c) the speed-time graph is a straight line parallel to the time axis.

(d) the acceleration-time graph is a straight line parallel to the time axis.

(x) For a uniformly retarded motion, the velocity-time graph is:

(a) a curve (b) a straight line parallel to the time axis

(c) a straight line perpendicular to the time axis.

(d) a straight line inclined to the time axis.

2. Define a scalar and a vector quantity. Give two examples of each. **[2]**
3. Define distance and displacement. Mention their SI units. **[2]**

4. Which physical quantity is obtained from the slope of (i) distance - t graph and (ii) v - t graph? If these graphs are straight lines parallel to x-axis, what do you infer in each case? **[2]**

5. Differentiate between uniform acceleration and variable acceleration. **[2]**

6. What do you mean by the terms: **[2×4=8]**
   (i) uniform speed (ii) variable speed
   (iii) average speed and (iv) instantaneous speed?

7. Define the following terms: **[2×5=10]**
   (i) velocity (ii) uniform velocity
   (iii) variable velocity (iv) average velocity and
   (v) instantaneous velocity

8. Calculate the acceleration of the car starting from rest which attains a velocity of 30 m/s in 0.05 h. **[3]**

9. A train passed the 100 km, 160 km and 220 km marks at 8:30 am, 9:30 am and 11:30 am. Find the average speed of the bus during: **[3]**
   (i) 8:30 am to 9:30 am (ii) 9:30 am to 11:30, and
   (iii) 8:30 am to 11:30 am.

10. In a picture tube electrons travel (at a constant speed) 20 cm in 10^{-5} s. What is their average speed? **[3]**

11. A body is dropped from the top of a tower. It acquires a velocity 20 ms^{-1} on reaching the ground. Calculate the height of the tower. (Take g = 10 m s^{-2}) **[3]**

12. A bullet initially moving with a velocity 20 ms^{-1} strikes a target and comes to rest after penetrating a distance 10 cm in the target. Calculate the retardation caused by the target. **[3]**

13. What do you mean by motion in one direction? **[3]**

14. Can displacement be zero even if distance is not zero? Give one example to explain your answer. **[3]**

15. Give an example of motion in which average speed is not zero, but the average velocity is zero. **[3]**

16. What is meant by the term retardation? Name its S.I. unit. **[3]**

17. Draw a displacement-time graph for a boy going to school with a uniform velocity. **[3]**

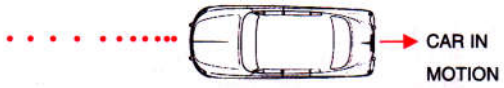
18. Define the term acceleration due to gravity. State its average value. **[3]**
"The value of **'g'** remains same at all places on the earth surface". Is this statement true? Give reason for your answer.

19. Derive following equation for a uniformly accelerated motion: **[3]**

(i) $v = u + at$ (ii) $S = ut + \frac{1}{2} at^2$ (iii) $v^2 = u^2 + 2aS$

where the symbols have their usual meanings.

20. The diagram (fig.) below shows the pattern of the oil dripping on the road, at a constant rate from a moving car. What information's do you get from it about the motion of car? **[4]**



21. A train is moving with a velocity of 90 km h^{-1}. It is brought to stop by applying the brakes which produce a retardation of 0·5 m s^{-2}. Find (i) the velocity after 10 s, and (ii) the time taken by the train to come to rest. **[4]**