PHYSICS

Class X

Sample Paper—2

Max. Marks: 50   **Time Allowed: 90 minutes**

General Instructions:

  (i) This question paper consists of 40 questions in 4 sections.

 (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

(iii) Section A consists of 10 Objective type questions carrying 1 mark each.

(iv) Section B consists of 10 Fill in the blanks type questions carrying 1 mark each.

 (v) Section C consists of 10 True or False statement type questions carrying 1 mark each.

(vi) Section D consists of 10 Short answer and Numerical type questions carrying 2 marks each.

Section A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 10.

1. A vernier calliper can measure length accurate upto

(a) 0.1 mm   (b) 1 mm

(c) 0.01 mm   (d) 1 cm

2. If momentum (P), area (A) and time (T) are taken to be fundamental quantities, then energy has the dimensional formula

(a) $(P^1 \, A^{-1} \, T^1)$ (b) $(P^2 \, A^1 \, T^1)$

(c) $(P^1 \, A^{-1/2} \, T^1)$ (d) $(P^1 \, A^{1/2} \, T^{-1})$

3. The velocity of a body at a given instant is called
   (a) instantaneous velocity
   (b) uniform velocity
   (c) non-uniform velocity
   (d) none of the above

4. In a freely falling body, the interchange of potential to kinetic energy takes place _____.
   (a) alternately between kinetic and potential
   (b) gradually from potential to kinetic
   (c) like that in a pendulum
   (d) gradually from kinetic to potential

5. Which of the following is not true of inclined planes?
   (a) A wedge and a screw both incorporate the use of inclined planes.
   (b) When a screw is used to lift objects, its mechanical advantage is greater than that of any simple machine.
   (c) Inclined planes and other simple machines reduce the effort required to perform a task.
   (d) A needle is an example of a wedge.

6. The number of significant figures in 0.06900 is
   (a) 5
   (b) 4
   (c) 2
   (d) 3

7. For a _____ pulley, the MA is 1.
   (a) movable
   (b) fixed
   (c) system of two movable
   (d) system of fixed and movable

8. Which of the following is a scalar quantity?
   (a) Displacement
   (b) Velocity
   (c) Speed
   (d) Force

9. The two factors on which the momentum of a body depends are _____ and _____.
   (a) velocity, time
   (b) mass, weight
   (c) mass, distance
   (d) mass, velocity

10. A force of 10 N is acting on an object of mass 10 kg. What is the acceleration produced in it?
   (a) 1 m/s^2
   (b) 1 m/s
   (c) 100 m/s^2
   (d) 100 m/s

Section B

Fill in the blanks with a suitable word for each of the questions 11 – 20.

11. The motion of a freely falling body is an example of _____ motion.

12. _____ is a straight or bent rod which can turn about a fixed point called fulcrum or pivot.

13. The number of meaningful digits in a number is called the number of _____ .

14. A _____ displacement-time graph represents non-uniform velocity.

15. The quantities that cannot be explained in terms of other physical quantities are called _____ .

16. Physical quantities which have both magnitude and direction are called _____ .

17. The metric unit of power is the _____.

18. _____ is the thrust per unit area of a surface.

19. The force of gravitation due to the earth is _____.

20. The energy of position-such as a rock on a hill is_____ energy.

Section C

State whether the following statements are true or false for each of the questions 21–30.

21. The energy possessed by an object is measured in terms of its capacity of doing work.

22. The acceleration is taken to be positive if it is in the direction of velocity.

23. Velocity is a derived quantity.

24. Potential energy is the energy of a body due to its motion.

25. Deceleration is a type of acceleration where the speed of an object is decreasing with time.

26. One metre is defined as the length of path covered by light, in vacuum, in a time interval of $\dfrac{1}{299792458}$ of a second.

27. The ratio of work output to work input in a machine is called efficiency of that machine.

28. An object maintains its motion under the continuous application of an unbalanced force.

29. A stopwatch is used to measure the time interval of an event.

30. The dimensional formula of density is $[M^0 \, L \, T^{-2}]$.

Section D

Answer each of the questions 31 – 40.

31. Figure shows the distance-time graph for the motion of two vehicles A and B. Which one of them is moving faster?
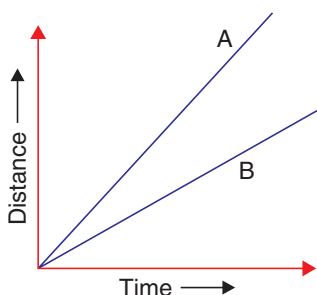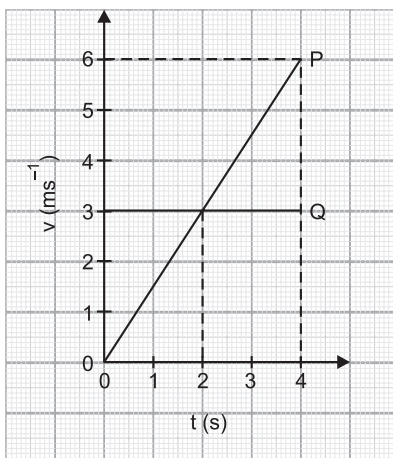

Distance-time graph for the motion of two cars

or

The speed-time graphs of two cars are represented by P and Q as shown below:

(a) Find the difference in the distance travelled by the two cars (in m) after 4 s.

(b) Do they ever move with the same speed? If so, when?

(c) What type of motion car P and car Q are undergoing?

32. Differentiate between derived and fundamental physical quantities.

or

What are scalar and vector quantities? Distinguish between scalars and vectors.

33. Explain the following giving suitable reasons.
   (a) A passenger in a bus tends to fall backwards when bus starts suddenly.
   (b) A passenger in a bus tends to fall forward when it stops suddenly.

34. When 6 g of a given substance is completely submerged in water, 5 ml of water is displaced. What is the density of the substance in g/cm^3?

35. A car having a mass of 500 kg is initially travelling with a speed of 80 km/hr. It slows down at a constant rate, coming to a stop in a distance of 50 m. What is the change in the car's kinetic energy over the 50 m distance it travels while coming to a stop?

36. Explain the concepts of work, power and energy.

or

What is a simple machine? What are the three advantages of a simple machine?

37. State Newton's second law of motion.

38. How much effort is needed to lift a load of 100 N placed at a distance of 20 cm from fulcrum, if effort is applied at 60 cm from the fulcrum on opposite side of the load? Calculate mechanical advantage of the lever.

39. Albert and Lisa live 2000 m from each other. Express the distance between their houses in kilometres (km.)

40. Manila says that the acceleration in an object could be zero even when several forces are acting on it. Do you agree with her? Why?