

## SECOND TERM EXAMINATION

### SCIENCE

(Class IX)

(Tissues, Motion, Force and Law of Motion, Structure of the Atom)

### Question Paper

#### Section A

20 X 1 = 20

1. One electron is present in the outermost shell of the atom of an element X. What would be the nature and value of charge on the ion formed if this electron removed from the outermost shell?
2. In the atom of an element X, 6 electrons are present in the outermost shell. If it acquires noble gas configuration by accepting requisite number of electrons, then what would be the charge on the ion so formed?
3. Which of the two would be chemically more reactive: element A with atomic number 18 or element D with atomic number 16 and why?
4. The atomic number of calcium and argon are 20 and 18 respectively but the mass number of both these elements is 40. What is the name given to such a pair of elements?
5. Which isotope of hydrogen contain same number of electrons, protons and neutrons?
6. Which meristem is present at growing tips of stems and roots?
7. Name the basic packing tissue of plants.
8. Why are cork impervious to gases and water?
9. Which complex permanent tissue conducts materials in both directions?

10. Which biochemicals compose the solid matrix of cartilage?

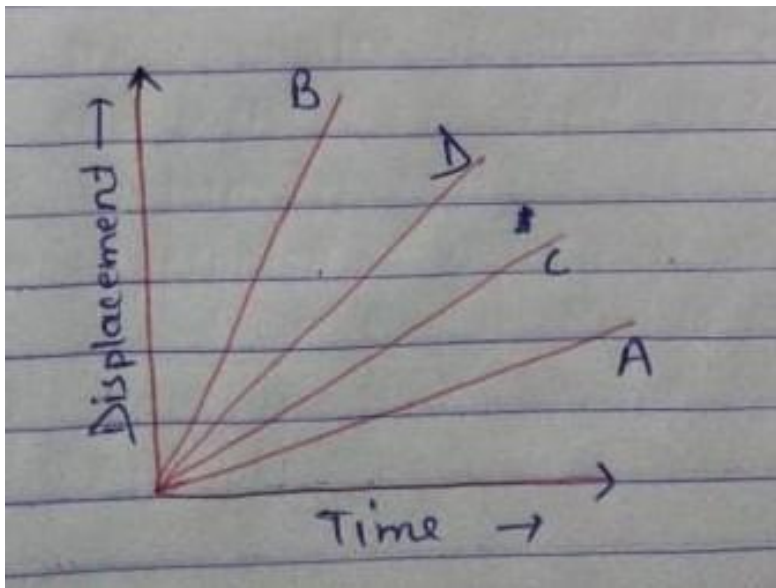
11. A particle is moving in a circular path of radius  $r$ . What will be the displacement after half a circle?

12. A particle moves 3m North, 4m East and finally 6m South. Calculate the displacement.

13. A physical quantity measured is  $-10\text{m/s}$ . Is it a speed or a velocity?

14. What is the numerical ratio of average velocity to average speed of an object when it is moving along a straight path?

15. Figure shows displacement -time graph of four children A, B, C and D. Which child has the highest velocity?

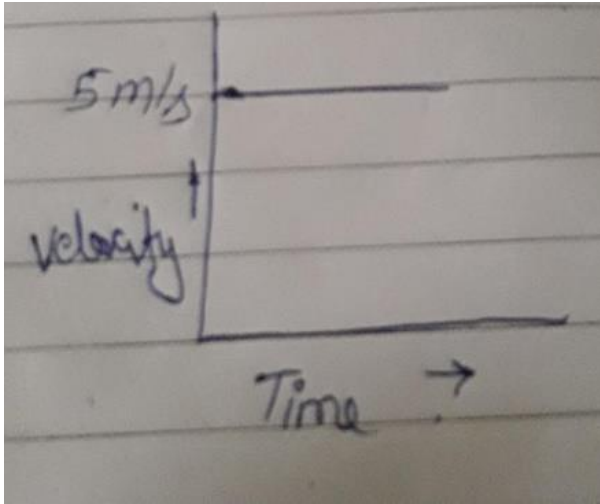


16. If  $F$  and  $F'$  are balanced forces, then what will be the magnitude of  $F_2$ ?

17. While riding on the bicycle, if we stop peddling, why does the bicycle begin to slow down?

18. What did Galileo conclude on the basis of his experiments on the motion of objects?

19. Velocity-time graph of a moving particles of mass 1 Kg is shown in figure.



Is any force acting on the body? Justify your answer.

20. A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal. Explain.

### Section B

15 X 3 =45

1. In the gold foil experiment of Geiger and Marsden, that paved the way for Rutherford's model of an atom,  $\sim 1.00\%$  of the  $\alpha$ -particles were found to deflect at angles  $> 50^\circ$ . If one mole of  $\alpha$ -particles were bombarded on the gold foil, compute the number of  $\alpha$ -particles that would deflect at angles less than  $50^\circ$ .
2. In response to a question, a student stated that in an atom, the number of protons is greater than the number of neutrons, which in turn is greater than the number of electrons. Do you agree with the statement? Justify your answer
3. Two ions having 3 negative and 3 positive charges are found to have 7 and 14 neutrons respectively. If electronic configuration of these ions are similar to that of neon, then find the mass of both the ions.
4. Draw a diagrammatic labelled sketch of stem tip to show the location of meristematic tissue. Mention the functions of different types of meristematic tissue.

5. List any six characteristics of parenchyma.

6. Name the tissue that smoothens bones surfaces at joints. Describe its structure with the help of a diagram.

7. Draw a labelled diagram of unstriated muscle tissue and mention its occurrence, features and functions.

8. Write functions of the following.

(i) Areolar connective tissues

(ii) Neurons

(iii) Adipose connective tissues

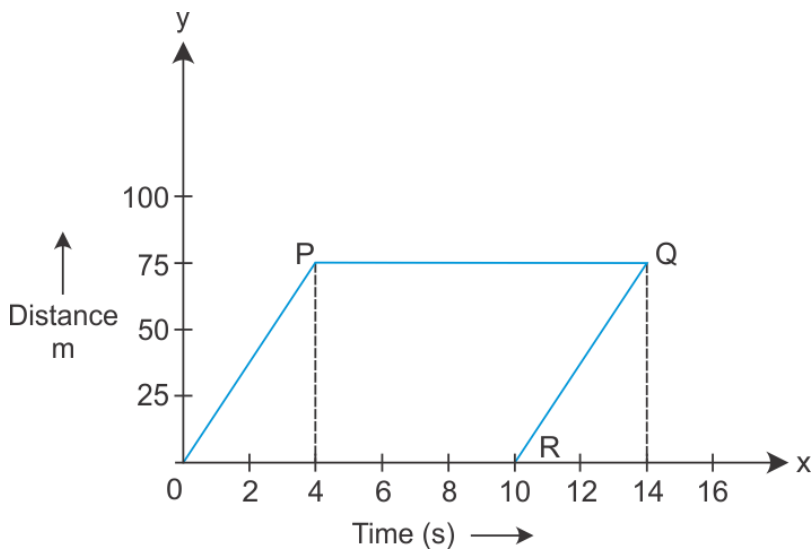
9. A cow and a bird both travelled from point 'A' to point 'B'. The cow travelled in a straight line but the bird travelled along the curved path as shown below:

a) What is the distance travelled by the cow?

b) What is the distance travelled by the bird?

c) Which one of them has more displacement?

10. The graph given below is the distance-time graph of an object

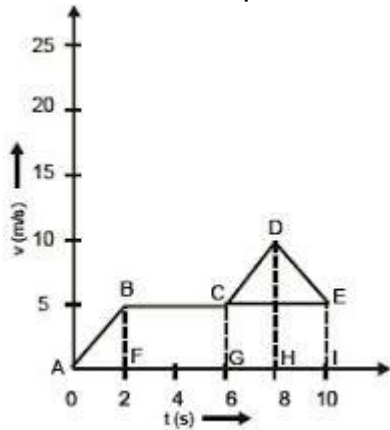


(i) Find the speed of the object during first four seconds of its journey.

(ii) How long was it stationary?

(iii) Does it represent a real situation? Justify your answer?

11. Find the total displacement of the body from the following graph.



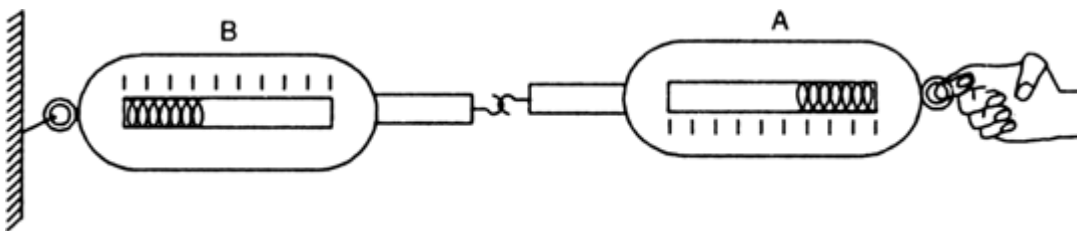
12. A car starts from rest and moves along the X- axis with constant acceleration  $5 \text{ m/s}^2$  for 8s. It then continues with constant velocity, then what distance will the car cover in 12 s, since it started from rest?

13. Give reason for the following

- (i) water sprinkler used for grass lawns begins to rotate as soon as water is supplied.
- (ii) Water drops are removed from wet clothes by giving tight jerk to the cloth

14. A bullet of mass  $4\text{g}$  when fired with a velocity of  $50\text{m/s}$  can enter a wall up to a depth of  $10\text{cm}$ . How much will be the average resistance offered by the wall?

15. Look at the diagram below and answer the following questions



- (i) When a force is applied through the free end of the spring balance A, the reading on the spring balance A is  $15 \text{ g-wt}$ . What will be the reading of spring balance B?
- (ii) Write reasons for your answer
- (iii) Name the force which balance A exerts on balance B and the force of balance B on balance A.

### Section C

**7 x 5 = 35**

1. A bullet of mass  $20\text{g}$  is horizontally fired with a horizontal velocity  $150 \text{ m/s}$  from a pistol of mass  $2 \text{ kg}$ . What is the recoil velocity of the pistol?

2. Give reason for the following:

- (i) It is difficult to balance our body when we accidentally step on a peel of a banana
- (ii) Pieces of bursting cracker fall in all possible directions.
- (iii) A glass pane of a window is shattered when a flying pebble hits it.
- (iv) A javelin thrower is marked foul, if an athlete crosses over the line marked for the throw. Athletes often fail to stop themselves before the line.

3. Distance travelled by a train and time taken by it is shown in the following table

- a) Plot distance-time graph.
- b) What is the average speed of the train?
- c) When is the train travelling at the highest speed?
- d) At what distance does the train slow down?
- e) Calculate the speed of the train between 10.40AM to 11.00 AM.

Time	Distance (in km)
10:00 am	0
10:30 am	25
10:40 am	28
11:00 am	40
11:15 am	42
11:30 am	50

4. Two stones are thrown vertically upwards simultaneously with their initial velocities  $u_1$  and  $u_2$  respectively. Prove that the heights reached by them would be in the ratio of  $u_1^2$  ;  $u_2^2$  ( Assume upward acceleration is  $-g$  and downward acceleration to be  $+g$  ).

5. (a) What will happen if cells are not properly organised in tissues?

(b) Under certain circumstances squamous epithelium is known as stratified squamous epithelium. Justify

6. (i) What is an octet? How do elements attain an octet?

(ii) Make a schematic atomic structure of magnesium and phosphorus

(given number of protons of magnesium =12 and that of phosphorus =15)

7. From Rutherford's  $\alpha$  particle scattering experiment, give the experimental evidence for deriving the conclusion that

(a) most of the space inside the atom is empty.

(b) the nucleus of an atom is positively charged.

(ii) An element has mass number = 32 and atomic number = 16 find

(a) the number of neutrons in the atom of the element.

(b) the number of electrons in the outermost shell of the atom

(iii) On the basis of Rutherford's model of an atom, which subatomic particle is present in the nucleus of an atom?