

9th CBSE Science Govt Model School

Student Name: _____ Roll. No. _____

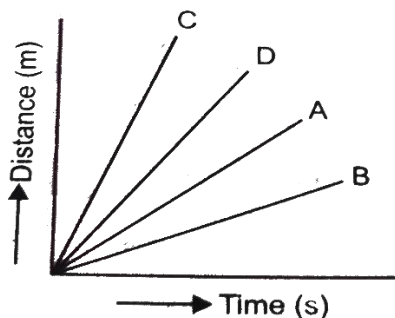
General Instructions:

- i. This question paper consists of 39 questions in 5 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 20 objective type questions carrying 1 mark each.
- iv. Section B consists of 6 very Short Answer type questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- vi. Section D consists of Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks **each** with sub-parts.

SECTION -A

1. On converting 25^oC, 38^oC and 66^oC to kelvin scale, the correct sequence of temperature will be:
(a) 298K, 311K and 339K (b) 298K, 300K, 338K
(c) 273K, 278K and 543K (d) 298K, 310K, 338K
2. Which cell organelle plays a crucial role in detoxifying many poisons and drugs in a cell?
(a) Golgi apparatus (b) lysosomes
(c) Smooth Endoplasmic reticulum (d) Vacuoles
3. A particle is moving in a circular path of radius r. The displacement after half a circle would be:-
(a) zero (b) πr (c) 2r (d) $2\pi r$
4. Weeds affect the crop plants by:
(a) killing of plants in field before they grow
(b) dominating the plants to grow
(c) Competing for various resources of crops (plants) causing low availability of nutrients
(d) All of the above
5. Tincture of iodine has antiseptic properties. This solution is made by dissolving:-
(a) Iodine in potassium iodide (b) Iodine in Vaseline
(c) Iodine in water (d) Iodine in alcohol
6. Voluntary muscles are found in:-
(a) Alimentary Canal (b) limbs
(c) Iris of the eye (d) Bronchi of lungs
7. A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal. This enables the goal keeper to:-
(a) Exert larger force on the ball
(b) Reduce the force exerted by the ball on hands

- (c) Increase the rate of change of momentum
(d) decrease the rate of change of momentum
8. Find out the correct sentence about manure:-
(i) Manure contains large quantities of organic matter and small quantities of nutrients
(ii) It increases the water holding capacity of sandy soil
(iii) It helps in draining out of excess of water from clayey soil
(iv) Its excessive use pollute environment because it is made of animal excretory waste:-
(a) (i) & (iii) (b) (i) & (ii) (c) (ii) & (iii) (d) (iii) & (iv)
9. Which of the following contains maximum no. of molecules?
(a) 1gm CO₂ (b) 1gm N₂ (c) 1 gm H₂ (d) 1 gm CH₄
10. A boy is writing a stone tied with a string in a horizontal circular path. If the string breaks, the stone:
(a) will continue to move in the circular path
(b) will move along a straight line towards the centre of the circular path
(c) will move along a straight line tangential to the circular path
(d) will move along a straight line perpendicular to the circular path away from the boy.
11. The number of electrons in an element X is 15 and the number of neutrons is 16. Which of the following is the correct representation of the element?
(a) ${}_{15}X^{31}$ (b) ${}_{16}X^{31}$ (c) ${}_{15}X^{16}$ (d) ${}_{16}X^{15}$
12. A girl is carrying a school bag of 3kg mass on her back and moves 200m on a levelled road. The work done against the gravitational force will be ($g=10\text{ms}^{-2}$)
(a) $6 \times 10^3 \text{J}$ (b) 6J (c) 0.6J (d) Zero
13. Sound travels in air if:-
(a) Particles of medium travel from one place to another.
(b) There is no moisture in the atmosphere
(c) disturbance moves
(d) both particles as well as disturbance travel from one place to another
14. Which of the following statements is not about an atom?
(a) Atoms are not able to exist independently
(b) Atoms are the basic units from which molecules and ions are formed
(c) Atoms are always neutral in nature
(d) Atoms aggregate in large numbers to form the matter that we can see, feel or touch.
15. Four cars A, B, C and D are moving on a levelled road. Their distance versus time graphs is shown in fig. Choose the correct statement.



- (a) Car A is faster than Car D
 (b) Car B is the slowest
 (c) Car D is faster than Car C
 (d) Car C is the slowest

16. In SONAR, we use:-

- (a) Ultrasonic waves
 (b) Infrasonic waves
 (c) Radio waves
 (d) Audible sound waves

Q.No.17 to 20 CONSIST OF TWO STATEMENTS-Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:-

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) Both A and R are true but R is not the correct explanation of A.
 (d) A is true but R is false

17. Assertion (A): An element is defined as the basic form of matter that cannot be broken down into simpler substances by chemical reaction.

Reason (R) : Non-metals are poor conductors of heat and electricity.

18. Assertion (A): Nucleus plays an important role in cellular reproduction and cellular reproduction and cellular functions.

Reason (R): Nucleus contains an important role in cellular reproduction and cellular functions.

Reason (R) : Area under velocity time graph gives the distance covered by the object in a given time.

19. Assertion (A): Slope of velocity time graph for linear motion gives the value of acceleration.

Reason (R) : Area under velocity time graph gives the distance covered by the moving object in a given time.

20. Assertion (A) : There are six macronutrients while there are seven micronutrients.

SECTIONS-B

Q. No. 21 TO 26 are very short answer questions carrying 2 marks each.

21. Why does our palm feel cold when put some acetone or perfume on it?
 22. How is a prokaryotic cell different from a eukaryotic cell?
 23. Which would require a greater force, accelerating a 2kg mass at 5 ms^{-2} or 4kg mass at 2 ms^{-2}

OR

A force of 5N gives a mass m_1 , an acceleration of 10 ms^{-2} and a mass m_2 an acceleration of 20 ms^{-2} , what acceleration would it give if both the masses were tied together.

24. Name the following:-

- (a) Tissue that forms the inner lining of our mouth
- (b) Tissue that connects muscle to bone in humans
- (c) Tissue that stores fat in our body
- (d) Connective tissue with a fluid matrix

25. What is the magnitude of the gravitational force between the earth and a 1kg object on its surface? (Mass of the earth is 6×10^{24} kg and radius of the earth is 6.4×10^6 m.)

OR

The volume of 50gm of a substance is 20 cm^3 . If the density of water is 1 gm cm^{-3} , will the substance float or sink?

26. What is meant by isotopes and isobars. Explain with proper examples in its favour.

SECTION-C

Q.No. 27 to 33 are short answer question carrying 3 marks each.

27. What factors are responsible for storage losses in agricultural produces and how they can be controlled and prevented?

28. A boy of mass 50kg runs up a staircase of 45 steps in 9 second. If the height of each step is 15 cm, find his power. Take $g = 10 \text{ ms}^{-2}$

OR

Certain force acting on a 20kg mass changes its velocity from 5 ms^{-1} to 2 ms^{-1} . Calculate the work done by the force?

29. What is the main function of each of the following cell components?

- (a) Plasma membrane
- (b) Mitochondria
- (c) Chromosomes
- (d) Lysosomes
- (e) Ribosomes
- (f) Gogi apparatus

30. Give reason for the following observations:-

- (a) We can get the smell of perfumes sitting several metres away.
- (b) Ice at 273K more effective in cooling than water at the same temperature.

31. Give reasons for the following:-

- (a) Cells of sclerenchyma tissue have a narrow lumen.
- (b) It is difficult to pull out the husk of coconut.
- (c) Muscles are able to contract and relax to bring about movements.
- (d) We get a crunchy and granular feeling when we chew pear fruit.

32. Illustrate the law of conservation of energy by discussing the energy changes which occur when we draw a pendulum bob to one side and allow it to oscillate. Why does the bob eventually come to rest? What happens to its energy eventually? Is it a violation of the law of conservation of energy?

33. The average atomic mass of a sample of an element X is 16.2u. What are the percentage of isotopes ${}_8\text{X}^{16}$ and ${}_8\text{X}^{18}$ in the sample?

SECTION-D

Q.No. 34 to 36 are long answer questions carrying 5 marks each.

34. (1) A sound wave has a frequency of 2KHZ and wavelength 35 cm. How long will it take to travel 1.5 km?
(2) Why are sound waves called mechanical waves.
(3) Draw a diagram depicting low pitched sound and high pitches sound. What is the main difference between the two?

OR

- (1) A person has a hearing range from 20 HZ to 20 KHZ. What are the typical wavelength of sound waves in air corresponding to these two frequencies? Take the speed of sound in air as 344 ms^{-1} .
(2) Flash and thunder are produced simultaneously. But thunder is heard a few seconds after the flash is seen, why?
(3) Draw a diagram depicting soft sound and louder sound. What is the main difference between the two?
35. (1) Write the formulae of following compounds:-
(a) Hydrogen sulphide (b) Carbon tetrachloride
(c) Aluminium oxide (d) Sodium carbonate
(2) Calculate the formulae unit mass of HNO_3 and CaCl_2 .

OR

- (1) Write the chemical formulae of the following:-
(a) Magnesium chloride (b) Calcium oxide
(c) Copper nitrate (d) Calcium Carbonate
(2) Calculate the formulae unit mass of HNO_3 and CaCl_2

OR

- (1) Write the chemical formulae of the following:-
(a) Magnesium chloride (b) Calcium oxide
(b) Copper nitrate (d) Calcium Carbonate
(2) Calculate the molar mass of the following:-
(a) Hydrochloric acid (HCl) (b) Ethyne (C_2H_2)
36. (1) Differentiate between isotonic, hypotonic and hypertonic solutions.
(2) What is the difference between the plasma membrane and cell wall? Give the functions of each one.

OR

- (1) Differentiate between Rough Endoplasmic Reticulum (RER) and Smooth Endoplasmic Reticulum (SER)
(2) Differentiate between Mitosis and Meiosis.

SECTION-E

Q.No. 37 to Q. No. 39 are Case based/Data based questions of 4 marks weightage each.

37. A small mass, such as a bullet may kill a person when fired from a gun. These observations suggest that the impact produced by the objects depends on their mass and velocity. Similarly if an object is to be accelerated we know that a greater force is required to given a greater

velocity. In other words there appears to exist some quantity of importance that combines the objects mass and its velocity. One such property is called momentum and was introduced by Newton. The momentum 'p' of an object is defined as the product of its mass (m) and velocity (v) that is:-

$$p = mv$$

Momentum has both direction and magnitude. Its direction is same as that of velocity. The S.I. unit of momentum is kilogram metre per second (kg ms^{-1}). Since the application of an unbalanced force brings a change in the velocity of the object, it is therefore clear that a force also produces a change of momentum.

(a) Define momentum and mention its SI unit.

(b) Which would require a greater force accelerating a 2kg mass at 5ms^{-2} or a 4kg mass at 2ms^{-2} .

(c) From the velocity time graph shown in fig. for a body of mass 5kg.

Find force on the body from:-

(i) O to A and (ii) B to C

- 38.** A group of students took an old shoe box and covered it with a black paper from all sides. They fixed a source of light (a torch) at one end of the box by making a hole in it and made another hole on the other side to view the light. They placed a milk sample contained in a beaker/tumbler in the box as shown in the fig. They were amazed to see that milk taken in the tumbler was illuminated. They tried the same activity by taking a salt solution but found that light simply passed through it?
- (a) Explain why the milk sample was illuminated. Name the phenomenon involved.
- (b) Some results were not observed with a salt solution. Explain.
- (c) Can you suggest two more solutions which would show the same effect as shown by the milk solution?
- 39.** The development of a fertilized egg into a newborn child requires an average of 41 rounds of mitosis. During this period the cell produced by mitosis enter different pathways of differentiation. Some becoming blood cells, some muscle cells, and so on. There are more than 100 visibly distinguishable kinds of differentiated cells in the vertebrate animal. These are organized into tissues, the tissues into organs. Groups of organs make up the various tissues into organs. Group of organs make up the various systems digestive, excretory etc. of the body. The actual number of differentiated cell types is surely much larger than 100.
- (a) Animals of colder regions and fishes of cold water have thicker layer of subcutaneous fat. Describe why?
- (b) Why are smooth muscles also known as visceral muscles?
- (c) What is the function of areolar tissue? Why is it a connective tissue?

OR

Adipocytes are special connective tissue. Why?

Matter in Our Surroundings

- Q1. On converting 25°C , 38°C and 66°C to kelvin scale...
 - Q21. Why does our palm feel cold when we put some acetone or perfume on it?
 - Q30(a)(b). Smell of perfume; Ice vs Water at 273K
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2. Is Matter Around Us Pure?

- Q5. Tincture of iodine...
 - Q38. Case study: Milk illuminated – Tyndall effect
-

3. Atoms and Molecules

- Q9. Which of the following contains maximum no. of molecules?
 - Q33. Average atomic mass of a sample (Isotopes %)
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4. Structure of the Atom

- Q11. Element X has 15 electrons and 16 neutrons...
 - Q26. What is meant by isotopes and isobars?
-

5. Motion

- Q3. Displacement after half a circle...
 - Q15. Distance vs time graph: Cars A, B, C, D
 - Q19. Assertion-Reason: Slope of velocity-time graph...
 - Q37. Case-based: Momentum and force on a 5 kg body
-

6. Force and Laws of Motion

- Q7. Goalkeeper pulling hands backward...
 - Q10. Stone in circular path if string breaks
 - Q23. Greater force: 2kg at 5ms^{-2} or 4kg at 2ms^{-2}
(also repeated in Case Q37(b))
 - Q37(a)(b). Momentum-based case
-

7. Gravitation

- Q25. Gravitational force between Earth and 1 kg object
OR Density comparison with water (float/sink)
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8. Work and Energy

- Q12. Work done against gravity = ?
 - Q28. (i) Power of a boy climbing stairs
OR (ii) Work done on 20 kg mass
 - Q32. Law of conservation of energy – Pendulum example
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9. Sound

- Q13. Sound travels in air if...
 - Q16. In SONAR we use...
 - Q34. Long answer: Frequency, mechanical wave, pitch/loudness
OR Thunder-light difference, sound range, diagrams
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10. The Fundamental Unit of Life

- Q2. Cell organelle for detoxifying poisons...
 - Q22. Difference between prokaryotic and eukaryotic cells
 - Q29. Functions of plasma membrane, mitochondria, etc.
 - Q36. Long answer: Isotonic/hypertonic, cell wall/membrane
OR RER/SER, Mitosis/Meiosis
-

11. Tissues

- Q6. Voluntary muscles are found in...
 - Q24. Tissue types: lining, muscle to bone, fat, fluid matrix
 - Q31. Reasoning: Sclerenchyma, coconut husk, muscular contraction, pear
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12. Why Do We Fall Ill?

- Q39. Case-based: Mitosis, cell differentiation, tissue to organ system
-

13. Improvement in Food Resources

- Q4. Weeds affect crop plants by...
- Q8. Correct sentence about manure...
- Q20. Assertion: Macronutrients vs micronutrients
- Q27. Factors responsible for storage loss in agriculture