9th CBSE Science St. Josephs 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.

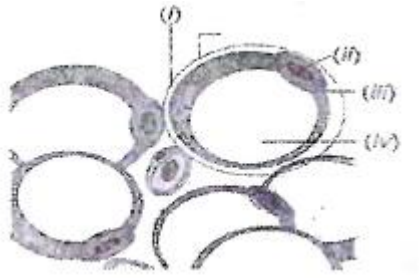
SECTION -A

1. The diffusion happens in liquids because
(a) Particles of liquids cannot move (b) Particles of liquids can move
(c) Force of attraction is maximum in liquids (d) Force of attraction is minimum in liquids

2. Animal feed includes roughage and concentrates. What are the characteristics of concentrates?
(a) High in fiber (b) Very few nutrients
(c) High level of proteins (d) Less water content

3. The site of detoxification in liver cells is
(a) lysosome (b) RER (c) ribosome (d) SER

4. Identify the fat storage area of adipose tissue shown in the figure



(a) (i) (b)(ii) (c) (iii) (d) (iv)

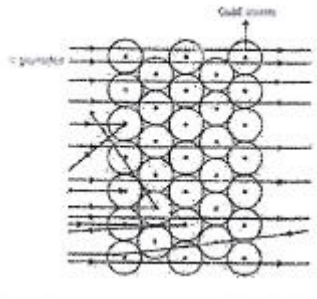
5. Which of the following is a compound
(a) Brass (b) Oxygen (c) Sodium chloride (d) Air

6. The formula of Chromium (III) phosphate is
(a) $Cr_2(PO_4)_3$ (b) $CrPO_4$ (c) $CrPO_3$ (d) Cr_3P_2

7. Which organelle is known as the 'powerhouse of the cell' because it produces energy in the form of ATP?
(*a*) Nucleus (b) Mitochondria (c) Ribosome (d) Golgi Apparatus

8. What is the angle between directions of force and displacement if work done is maximum?
(a) 0° (b) 30^0 0(c) 60° (d) 90°

9. Following conclusions were drawn from the given figure:

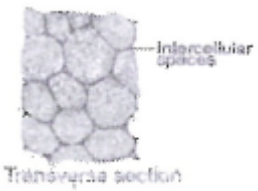


I. There is a positively charged centre in an atom called the nucleus.
II. An atom consists of a positively charged sphere and the electrons are embedded in it.
III. The electrons revolve around the nucleus in well-defined orbits.
IV. The size of the nucleus is very small as compared to the size of the atom.
V. Only certain special orbits known as discrete orbits of electrons are allowed inside the atom.
Choose the correct statements.
(a) I, II and III (b) II, III and V (c) I, III and IV (d) All of these

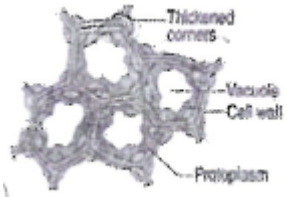
10. If you want to double the acceleration of a body of given mass, you have to
(a) double the force applied (b) halve the force applied
(c)quadruple the force applied (d) make the force applied zero

11. The flexibility in plants is due to a permanent tissue. This permanent tissue allows easy bending in various parts of a plant without breaking. It also provides mechanical support to plants. From the given figures identify that tissue

(a)



(b)



(c)

(d)

12. If the weight of a 60 kg mass *is* W on moon, then W is equal to
(a) 48 N (b) 80 N (c) 100 N (d) 108 N

13. $^{12}_{6}C$, $^{13}_{6}C$, $^{14}_{6}C$ are
(a) Isobars (b) Isotopes (c) Isotones (d) All of these

14. The mass ratio of P and H in PH_3 [P = 31u, H= 1u] is
(a) 1 : 3 (b) 14:3 (c) 3:14 (d) 31:3

15. A student lists four compounds: PCl_5, KBr, $P4O_{10}$, Na_2CO_3. Which compound contains potassium.
(a) KBr (b) P_40_{10} (c) PCl_5 (d) Na_2CO_3

16. Sound waves propagate through a medium in the form of
(a) pressure variations (b) density variation
(c) compressions and rarefactions (d) all of these

Q. **No 17 to 20 are Assertion- Reasoning based questions**.

These 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 and R is not the correct explanation of A.

c. A is true but *R* is false d. A *is* False but R is true

17. **Assertion:** Boiling point of sea water is more than 100°C. (a)
Reason: Soluble impurities increase the boiling point of liquid.

18. Assertion**:** In both plant and animal cells, the main area of cellular activities is cytoplasm.
Reason: Various chemical reactions occur in cytoplasm to keep the cell in living state.

19. **Assertion:** Gravitational force exists between all objects in a room yet they do not move towards each other.
Reason: Gravitation is the weakest force in nature.

20. Assertion**:** Iron fillings and sulphur powder form heterogeneous mixture.
Reason: Sulphur is soluble in carbon disulphide which should be kept away from flame because it is inflammable.

SECTION-B

Q. No 21 to 26 are Very Short answer questions

21. Write the observations of Rutherford's alpha particle scattering experiment.

22. Rahul observed following a permanent slide of animal tissue in microscope.
1.Cells are long and pointed ends (spindle shaped)
2.Uninucleate and unbranched
(A) Identify the tissue and write its name
(B) Write its one function.

23. The following data represents the distribution of electrons, protons and neutrons in atoms of four elements A, B, C, D.

Elements	Protons	Neutrons	Electrons
A	19	21	19
B	17	18	17
C	17	20	17
D	18	22	18

Answer the following questions:
(a) Describe the electronic distribution in atom of element B.
(b) Is element B a metal or a non-metal? Why?
(c) Which two elements form a pair of Isotopes?
(d) Which two elements form a pair of Isobars?

24. Calculate the force required to impart a car with a velocity of 30 m/s in 10 s starting from rest. Study the velocity-time graph and calculate
(a) The acceleration from A to B (b) The distance covered in the region ABE

25. Metal 'Y' forms a carbonate with formula $Y_2(CO_3)_3$ what will be the formula of the chloride and oxide of metal 'Y'.

OR

26. When 3.0g of magnesium is burnt in 2.00g of oxygen, 5.00g of magnesium oxide is produced. What mass of magnesium oxide will be formed when 3.00g magnesium is burnt in 5.00g of oxygen? Which law of chemical combination will govern your answer?

SECTION-C

Q. No. 27 to 33 are **short answer questions.**

27. What is the function of:
(a) cellulose in cell wall?
(b) presence of deeply folded membrane in mitochondria?
(c) digestive enzymes in lysosomes?

28. When loading a truck, a man lifts boxes of 100 N each through a height of 1.5 m.
(a) How much work does he do in lifting one box**?**
(b) How much energy is transferred when one box is lifted?
(c) If the man lifts 4 boxes per minute, at what power is he working? ($g = 10\ m\ s^{-2}$)

OR

Derive an expression for the kinetic energy of the body? Calculate the kinetic energy for a body of 5 Kg moving a velocity 2.5 m/s^2

29. (a) The power of a motor pump is 2 kW. How much water per minute can the pump raise to a height of 10m? Take $g = 10m/s^2$
(b) State Archimedes' Principle.

30. A farmer wants to harvest more than two varieties at a time from his crop field. He has no idea about the cropping patterns. Suggest him one method to get the desired result. Also state two advantages of this cropping pattern.
(b) Name any two fodder crops.

31. (a)Convert 250 K into Celsius scale and -20°C into Kelvin scale.
(b) Give Reason: Dogs generally hang out their tongue in summer.

32. An object is moving along a straight line with uniform acceleration. The following table gives the velocity of the object at various instants of time.

Time (s)	0	1	2	3	4	5	6
Velocity (ms^{-1})	2	4	6	8	10	12	14

(a)Plot the Graph. (b)From the Graph: Find the velocity of the object at the end of 2.5 sec.
(c) Calculate the acceleration.

33. (*a*) You can very easily bend the stem of a plant without breaking it. Name the tissue in the plant which makes it possible. Where is it located? State any two characteristic features of the

cells of this tissue.

(b)Draw a labelled diagram of the transverse section of this tissue.

SECTION-D

Q. No 34 to 36 are long **answer questions**

34. (*a*) An ion M^{2+}contains 10 electrons and 12 neutrons. What is the atomic number and mass number of the element M?

(b) Is it possible in an atom to have 12 protons and 13 electrons? Explain.

(c) Why is helium gas inert?

(d) Draw a sketch of Bohr model of an atom with atomic number 15 and write its electronic configuration

35. (a) State Universal law of gravitation. Derive the expression for the gravitational force between the earth and an object lying on the surface of the earth.

(b) The gravitational force between two objects is F. If masses of both objects are halved without changing distance between them, then calculate the new gravitational force.

36. (a) The growth of plants occurs only in certain specific regions. Name the tissue present in the area where the growth of plant takes place. Explain that tissue and its types with the help of a diagram. (b) Write down the functions of each type.

OR

(a) State two differences between egg layers and broilers.

(b) How can poultry fowl be prevented from various diseases? State any three methods.

SECTION-E

Q. No. 37 to 39 are case-based / data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. A solution is a homogeneous mixture of two or more substances. You come across various types of solutions in your daily life. Lemonade, soda water etc. are all examples of solutions. Usually we think of a solution as a liquid that contains either a solid, liquid or a gas dissolved in it. But, we can also have solid solutions (alloys) and gaseous solutions (air). In a solution there is homogeneity at the particle level. For example, lemonade tastes the same throughout. This shows that particles of sugar or salt are evenly distributed in the solution.

(A) What is meant by solubility?

(B) What would happen if you were to take a saturated solution at a certain temperature and cool it slowly?

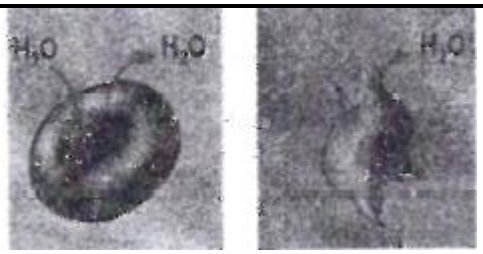
Attempt either subpart C or D

(C) (i) What is meant by unsaturated solution?

(ii) What is meant by the concentration of the solution?

(D) What is meant by suspension? Give its two characteristics.

38. Observe the given figure and answer the following question. Identify the type of solution in which cells A and B are placed. (Consider the cells as A and B respectively).



(A) Observe the given figure and answer the following question. Identify the type of solution in which cells A and B are placed. (Consider the cells as A and B respectively).

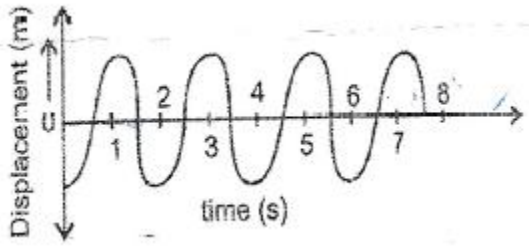
(B) What has happened to cells? Explain. (Consider the cells as A and B respectively)

Attempt either subpart C or D

(c)What will happen to plant cell if kept in very dilute medium.

(d) Name and explain the process involved in the exchange of water in a cell.

39. The given graph shows the displacement versus time relation for a disturbance travelling with a velocity of 1500 ms^{-1}.



(A) Calculate the time period and frequency.

(B) Find the wavelength of disturbance.

Attempt either subpart C or D

(C) The velocity of sound in air is 340 m/s. Compute its wavelength when the frequency is 250 Hz.

(D) Find its frequency when the wavelength is 85 cm.