



INDIAN SCHOOL SOHAR
FINAL EXAMINATION (2023-24)
SCIENCE THEORY (086)

No of Printed Pages: 7

CLASS: IX
DATE: 11/02/2024

MAX. MARKS: 80
TIME: 3 HOURS

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. 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 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 3 Long Answer type questions carrying 05 marks each. Answer 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

Select and write the most appropriate option out of the four options given for each of the questions 1 -20.

1	Which one of the following sets of phenomena would increase on raising the temperature? (a) Diffusion, evaporation, compression of gases. (b) Evaporation, compression of gases, solubility. (c) Evaporation, diffusion, expansion of gases. (d) Evaporation, solubility, diffusion, compression of gases.	1
2	Seema visited a Natural Gas Compressing Unit and found that the gas can be liquified under specific conditions of temperature and pressure. While sharing her experience with friends she got confused. Help her to identify the correct set of conditions. (a) Low temperature, low pressure (b) High temperature, low pressure (c) High temperature, high pressure (d) Low temperature, high pressure	1
3	The chemical formula of Ammonium sulphate is _____ (a) NH_4SO_4 (b) NH_4SO_2 (c) $(\text{NH}_4)_2\text{SO}_4$ (d) NH_2SO_4	1
4	Sol and gel are examples of _____ (a) a solid-liquid colloid and gel is liquid-solid colloid (b) solid-solid colloids (c) solid- solid colloid and gel is solid-liquid colloid (d) a liquid-solid colloid and gel is a solid-liquid colloid	1
5	The combining capacity of an element is called _____ (a) valency (b) atomicity (c) atomic number (d) valence electrons	1

6	Nucleus consists of _____ (a) Proton and Electron (c) Proton and Neutron	(b) Electron and Neutron (d) Neutron only	1
7	According to law of conservation of mass, during any physical or chemical change, the total mass of the products remains equal to the total mass of the _____ (a) Reactants (c) Reagents	(b) Intermediates (d) Catalysts	1
8	The granular structures present on the rough endoplasmic reticulum are (a) Lipids (c) Ribosomes	(b) Plastids (d) Lysosomes	1
9	The cell organelle which plays a crucial role in detoxifying many poisons and drugs in liver cells. (a) Golgi apparatus (c) Smooth endoplasmic reticulum	(b) Lysosomes (d) Vacuoles	1
10	In desert plants, rate of water loss gets reduced due to the presence of (a) Cuticle (c) Lignin	(b) Stomata (d) Suberin	1
11	The type of epithelial cells that help small Intestine to absorb the digested food materials. (a) Stratified squamous epithelium (c) Spindle fibers	(b) Columnar epithelium (d) Cuboidal epithelium	1
12	To solve the food problem of the country, which among the following is necessary? (a) Increased production and storage of food grains (b) Easy access of people to the food grain (c) People should have money to purchase the grains (d) All of the above		1
13	A body travels along a circular path of radius 70 m. After travelling half a revolution in 20 s, the average velocity is (a) 7 m/s (b) 11 m/s	(c) 0 m/s (d) 22 m/s	1
14	Four objects are moving. Which object has a zero resultant force acting on it? (a) the object moving at a decreasing speed (b) the object moving at an increasing speed (c) the object moving at a constant speed in a circle (d) the object moving at a constant speed in a straight line		1
15	A crop X is to be grown in a field. It is seen that Parthenium, a type of weed usually affects crop X. What measure would help to protect crop X from Parthenium? (a) Spraying insecticides (b) Avoiding crop rotation (c) Burning the field before sowing the crop (d) Delaying the sowing of crops by a few days.		1
16	The muscular tissue which can function throughout life continuously without fatigue is (a) Skeletal muscle (c) Smooth muscle	(b) Cardiac muscle (d) Voluntary muscle	1

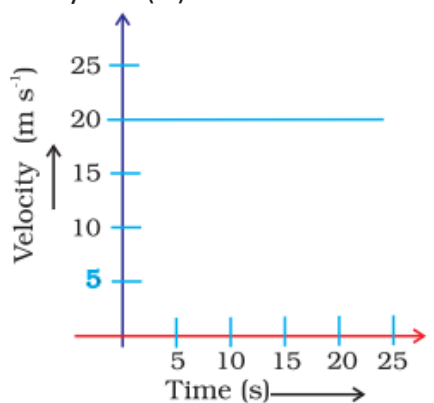
Question No. 17 to 20 consist of two statements - Assertion **(A)** and Reason **(R)**. Answer these questions selecting the appropriate option given below:

- (a) Both Assertion and Reason are true, and R is the correct explanation of A.

	(b) Both Assertion and Reason are true, and R is not the correct explanation of A. (c) Assertion is true but Reason is false. (d) Assertion is false but Reason is true.	
17	Assertion: Alloys are a homogeneous mixture of metals. Reason: Alloys can be separated into their components by physical methods.	1
18	Assertion: Bone and cartilage are dense connective tissue. Reason: Ligament connects bone to muscles.	1
19	Assertion: When distance between two bodies is doubled and also mass of each body is doubled, then the gravitational force between them remains the same. Reason: According to Newton's law of gravitation, force is directly proportional to the product mass of bodies and inversely proportional to the square of the distance between them.	1
20	Assertion: Plasma membrane is selectively permeable. Reason: Plasma membrane allows all molecules to pass through it.	1

Section-B

Question No. 21 to 26 are very short answer questions

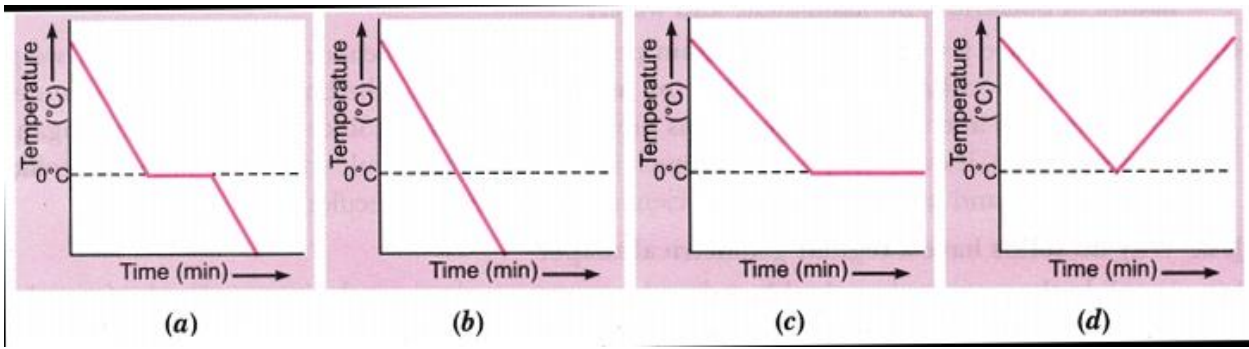
21	(a) Why do we see water droplets on the outer surface of a glass containing ice cold water? (b) Reena was making tea in a kettle. Suddenly she felt intense heat from the puff of steam gushing out of the spout of the kettle. She wondered whether the temperature of the steam was higher than that of the water boiling in the kettle. Comment.	2
22	An Italian bee variety <i>A. mellifera</i> has been introduced in India for honey production. Write about its merits over other varieties.	2
23	A plant cell cannot survive without chloroplast. Justify. OR Define the term endocytosis? Why is endocytosis found only in animal cells?	2
24	How will the equations of motion for an object moving with a uniform velocity change? OR The following velocity-time graph shows the motion of a cyclist. Find (i) its acceleration, (ii) its velocity and (iii) the distance covered by the cyclist in 15 seconds. 	2
25	State the second law of motion. Using the second law of motion, derive the relation between force and acceleration.	2
26	Give reasons: (a) Meristematic cells have a prominent nucleus and dense cytoplasm but lack vacuole. (b) Branches of a tree move and bend freely in high wind velocity.	2

Section-C

Question No. 27 to 33 are short answer questions

27 (a) What happens to naphthalene balls kept in stored clothes in our homes? Explain.
 (b) A glass tumbler containing hot water is kept in the freezer compartment of a refrigerator (temperature $< 0^{\circ}\text{C}$). If you could measure the temperature of the content of the tumbler, which of the following graphs would correctly represent the change in its temperature as a function of time?

3



28 a) During an experiment the students were asked to prepare a 10% (Mass/Mass) solution of sugar in water. Ramesh dissolved 10 g of sugar in 100 g of water while Sarika prepared it by dissolving 10 g of sugar in water to make 100 g of the solution. Compare the mass % of the two solutions.
 b) Which of the following shows the “Tyndall effect”? Salt solution, Milk, Copper sulphate solution, Starch solution.
OR
 (i) On heating CaCO_3 , it gets converted to CaO and CO_2 . What change do you notice? Justify your answer.
 (ii) Tincture of iodine has antiseptic properties. How is the solution formed? Mention its components.
 (iii) List any two properties of non-metals.

3

29 Give the differences between the two cells shown in the diagram (any three).

3



30 What would happen if;
 (a) An animal cell is placed in a medium having higher water concentration.
 (b) A plant cell is placed in a medium having lower water concentration.
 (c) An animal cell is placed in a medium having equal water concentration as the cell cytoplasm.

3

31 Establish the relationship between speed of sound (v), its wavelength (λ) and frequency (ν). If velocity of sound in air is 340 m s^{-1} , calculate
 (i) wavelength when frequency is 256 Hz.
 (ii) frequency when wavelength is 0.85 m

3

32	(a) Can any object have momentum even if its mechanical energy is zero? Explain. (b) What is the work done by the force of gravity on a satellite moving round the earth? Justify.	3
33	An aeroplane of mass 3.4×10^5 kg accelerating uniformly from rest along a runway. After 26 s, it reaches a speed of 65 m/s. (a) Calculate I. the acceleration of the aeroplane II. the resultant force on the aeroplane. (b) Just after taking off, the aeroplane continues to accelerate as it gains height. State two forms of energy that increase during this time.	3

Section-D

Question No. 34 to 36 are long answer questions.

34	(a) Write the formula of Sodium carbonate and calculate its formula mass. (b) Two elements, C and D, have the same mass number of 40. Their atomic numbers are 18 and 20, respectively. (i) How are these elements related? (ii) Do they have similar chemical properties? (iii) Show diagrammatically the electron distribution of element C. (c) Name the element and its symbol which is used as a standard for atomic mass scale. OR (a) An element X has an atomic number 12 and mass number 24. Draw a diagram showing the distribution of electrons in the orbits and mention the nuclear composition of the neutral atom of the element X. (b) (i) Write the chemical symbol for Iron and Platinum. (ii) What are canal rays? (c) An ion M^{3-} contains 10 electrons and 7 neutrons. What is the atomic number and mass number of the element M?	5
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35	Complete the following blanks in the given table.	5																				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Sl No</th> <th style="width: 20%;">Type of Epithelium</th> <th style="width: 30%;">Structure</th> <th style="width: 40%;">Location in the body</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(a)</td> <td>Cells are thin, flat and irregular</td> <td>Oesophagus, Lining of mouth, lung alveoli</td> </tr> <tr> <td>2</td> <td>Cuboidal</td> <td>Cells are cuboidal with round nucleus at the centre.</td> <td>(b)</td> </tr> <tr> <td>3</td> <td>(c)</td> <td>Cells are tall (pillar like)</td> <td>(d)</td> </tr> <tr> <td>4</td> <td>Stratified squamous</td> <td>Flat squamous cells arranged in many layers</td> <td>(e)</td> </tr> </tbody> </table>	Sl No	Type of Epithelium	Structure	Location in the body	1	(a)	Cells are thin, flat and irregular	Oesophagus, Lining of mouth, lung alveoli	2	Cuboidal	Cells are cuboidal with round nucleus at the centre.	(b)	3	(c)	Cells are tall (pillar like)	(d)	4	Stratified squamous	Flat squamous cells arranged in many layers	(e)	
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OR

Complete the following blanks in the given table.

Sl No	Striated Muscle	Non-striated Muscle	Cardiac Muscle
1	(a)	They are involuntary in nature	They are involuntary in nature
2	They are mostly attached to bones and help in Movement.	They are present in alimentary canal, uterus etc.	(b)
3	They are also called skeletal muscles.	(c)	They are called cardiac muscle
4	(d)	They don't have alternate dark and light bands.	They have light striations
5	(e)	The cells are long with pointed ends.	The cells are long and branched

36

- (a) A sound wave in air consists of alternate compressions and rarefactions along its path.
(i) Explain how a compression differs from a rarefaction.
(ii) Explain, in terms of compressions, what is meant by (i) the wavelength of the sound and (ii) the frequency of the sound.
(b) Draw a graph for a wave representing wave disturbance and time for a sound changing from low pitch to high pitch, keeping the amplitude of the sound the same.

OR

- (a) Draw a graph showing density or pressure variations with respect to distance for a disturbance produced by sound. Mark the position of compression and rarefaction on this curve.
(b) Also, define the wavelength and time period using this graph.
(c) What is reverberation? What measures are taken to reduce reverberation in the cinema hall?

5

Section - E

Question 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

Atom consists of electrons, protons and neutrons. J.J. Thomson proposed that electrons are embedded in a positively charged uniform sphere. Rutherford alpha -scattering experiment led to discovery of nucleus in the centre of an atom, which is positively charged and whole mass of the atom is concentrated in the nucleus. Neil Bohr proposed that electrons are distributed in different shells in K, L, M, N with discrete energy around the nucleus. If atomic shell is complete, atom will be stable and less reactive.

- (a) i) Why did Rutherford select a gold foil in his α -ray scattering experiment?
ii) Is it possible for the atom of an element to have one electron, one proton and no neutron. If so, name the element.
(b) i) One electron is present in the outer most shell of the atom of an element X. What would be the charge and the magnitude of the ion formed, when the outermost electron is removed from that atom?
ii) What term is commonly used to describe the ion formed, when an atom gains electrons?

4

OR

	(b) Why does an atom of Argon have zero valency? Explain using the electronic configuration of Argon.	
38	<p>Despite the availability of various weed control methods, managing weeds remains a significant challenge for farmers worldwide. Factors such as herbicide resistance, environmental concerns, and the need for sustainable farming practices continue to drive research and innovation in weed management strategies.</p> <p>Field crops are infested by a large number of insect pests like Aphids, Locusts, Thrips and Termites. If the pests are not controlled at the appropriate time, they can damage the crops so much.</p> <p>(a) Why is it essential to remove weeds for a good harvest? (b) How do insect pests attack our crops? (any two points) (c) Discuss why pesticides are used in very accurate concentration and in very appropriate matter.</p> <p style="text-align: center;">OR</p> <p>(c) Suggest any two ways to control pests during storage of grains.</p>	4
39	<p>How do submarines float and sink?</p>  <p>Using Archimedes' Principle, it is clear that a change in mass of an object affects how much liquid has to be displaced. In submarines, this is controlled by ballast tanks (A ballast tank is a compartment within a ship that holds water, which is used to provide hydrostatic stability). When the tanks are empty, the submarine has less mass and it floats like a normal ship. As water is allowed into the tanks, the mass of the submarine increases, the downward gravitational force on the submarine. Increases and the submarine begins to sink. Careful balancing of the water ballast enables the craft to stay at any chosen depth.</p> <p>(a) State Archimedes principle, (b) What is the unit of upward thrust? (c) The volume of 50 g of a substance is 20 cm³. If the density of water is 1 g/cm³, will the substance float or sink?</p> <p style="text-align: center;">OR</p> <p>(c) What is the buoyant force experienced by a cube of side 10 cm which is completely immersed in water? (take $g = 10 \text{ m/s}^2$ and density of water = 1000 kg/m³)</p>	4