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INDIAN SCHOOL SALALAH
FIRST TERM EXAMINATION – SEPTEMBER 2024



SCIENCE- (086)

Class: X

Date: 18-09-2024

Time: 3 hours

Maximum Marks: 80

General Instructions:

- (i) This question paper comprises of **39** questions. **All** questions are compulsory
- (ii) This question paper is divided into **five** sections - **A, B, C, D** and **E**.
- (iii) **Section A** - Question No **1** to **20** are multiple choice questions. Each question carries **1** mark.
- (iv) **Section B** - Question No. **21** to **26** are very short answer type questions. Each question carries **2** marks. Answers to these questions should be in the range of 30 to 50 words.
- (v) **Section C** - Question No. **27** to **33** are short answer type questions. Each question carries **3** marks. Answers to these questions should be in the range of 50 to 80 words.
- (vi) **Section D** - Question No. **34** to **36** are Long Answer type questions Each question carries **5** marks. Answers to these questions should be in the range of 80 to 120 words.
- (vii) **Section E**- Question No. **37** to **39** are source-based/case-based units of assessment carrying **4** marks each with sub-parts.
- (viii) There is no overall choice. However, an internal choice has been provided in some sections. Only one of the alternatives has to be attempted in such questions.

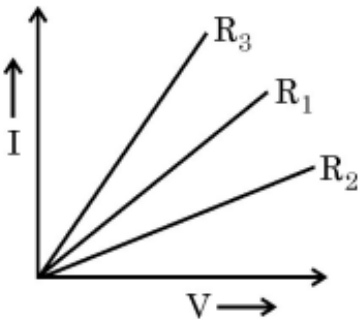
SECTION-A

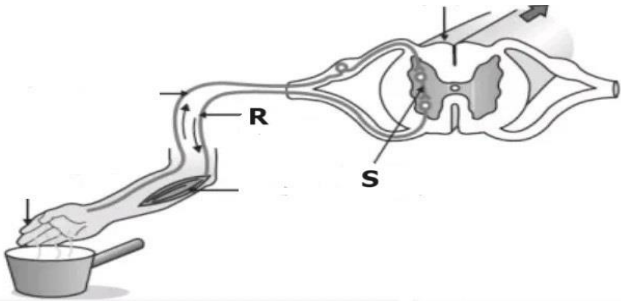
Select and write the most appropriate option out of the four options given for each of the question no. **1** to **20**.

1	Which of the statements about the reaction below is correct? $\text{H}_2\text{S}_{(g)} + \text{Cl}_{2(g)} \rightarrow 2\text{HCl}_{(g)} + \text{S}_{(s)}$ (a) H_2S is getting reduced (b) Cl_2 is getting oxidized. (c) H_2S is getting oxidized. (d) HCl is getting reduced.	1
2	An aqueous solution turns the red litmus solution blue. Excess addition of which of the following would reverse the change? (a) NaHCO_3 (b) HCl (c) NH_4OH (d) $\text{Ca}(\text{OH})_2$	1

3	<p>The ratio (X: Y) of reactants Fe and H₂O in the given balanced chemical equation is.</p> $\mathbf{X} \text{Fe}_{(s)} + \mathbf{Y} \text{H}_2\text{O}_{(g)} \rightarrow \text{Fe}_3\text{O}_4 (s) + 4\text{H}_2 (g)$ <p>(a) X:Y = 2:3 (b) X:Y = 3:4 (c) X:Y = 1:4 (d) X:Y = 4:1</p>	1																				
4	<p>Study the reaction between water and different metals shown in the table below.</p> <table border="1"> <thead> <tr> <th>Observation</th> <th>Metal</th> <th>Reacts with</th> <th>Gas evolved</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Sodium</td> <td>Cold water</td> <td>Yes</td> </tr> <tr> <td>2</td> <td>Magnesium</td> <td>Hot water</td> <td>No</td> </tr> <tr> <td>3</td> <td>Iron</td> <td>Steam</td> <td>Yes</td> </tr> <tr> <td>4</td> <td>Copper</td> <td>Hot water</td> <td>Yes</td> </tr> </tbody> </table> <p>Which of the above observation(s) are correct? (a) Observation 1 & 2 (b) Observation 2 & 3 (c) Observation 1 & 3 (d) Observation 1, 2, & 4</p>	Observation	Metal	Reacts with	Gas evolved	1	Sodium	Cold water	Yes	2	Magnesium	Hot water	No	3	Iron	Steam	Yes	4	Copper	Hot water	Yes	1
Observation	Metal	Reacts with	Gas evolved																			
1	Sodium	Cold water	Yes																			
2	Magnesium	Hot water	No																			
3	Iron	Steam	Yes																			
4	Copper	Hot water	Yes																			
5	<p>Which of the following pairs will give displacement reactions?</p> <p>i) NaCl and copper metal ii) FeSO₄ and Zinc metal iii) MgCl₂ and aluminium metal iv) AgNO₃ and copper metal</p> <p>(a) i & ii (b) i & iii (c) iii & iv (d) ii & iv</p>	1																				
6	<p>Which of the following statement(s) is (are) true about respiration?</p> <p>(i) During inhalation, ribs move inward and diaphragm is raised (ii) In the alveoli, exchange of gases takes place i.e., oxygen from alveolar air diffuses into blood and carbon dioxide from blood into alveolar air (iii) Haemoglobin has greater affinity for carbon dioxide than oxygen (iv) Alveoli increase surface area for exchange of gases</p> <p>(a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (iii) (d) (ii) and (iv)</p>	1																				

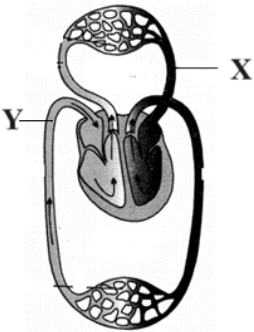
7	Select the option that correctly identifies the sequence of processes of urine formation. (a) Reabsorption, Glomerular filtration. Secretion (b) Glomerular filtration, Reabsorption, Secretion (c) Glomerular filtration, Secretion, Reabsorption (d) Reabsorption, Secretion, Glomerular filtration	1
8	The water which is lost through the stomata is replaced by (a) water from the phloem vessels in the leaf (b) water from the xylem in the leaf (c) water from the veins in the leaf (d) water from stem	1
9	During deficiency of oxygen in tissues of human beings, pyruvic acid is converted into lactic acid in the (a) cytoplasm (b) chloroplast (c) mitochondria (d) golgi body	1
10	Which part of alimentary canal receives bile from the liver? (a) Stomach (b) Small intestine (c) Large intestine (d) Oesophagus	1
11	Which of the following statements about transmission of nerve impulse is incorrect? (a) Nerve impulse travels from dendritic end towards axonal end. (b) At the dendritic end electrical impulses bring about the release of some chemicals which generate an electrical impulse at the axonal end of another neuron. (c) The chemicals released from the axonal end of one neuron cross the synapse and generate a similar electrical impulse in a dendrite of another neuron. (d) A neuron transmits electrical impulses not only to another neuron but also to muscle and gland cells.	1
12	A student conducts an activity using a concave mirror with focal length of 10 cm. He placed the object 15 cm from the mirror. Where is the image likely to form? (a) At 6 cm behind the mirror (b) At 30 cm behind the mirror (c) At 6 cm in front the mirror (d) At 30 cm in front of the mirror	1

13	<p>Which of the following statements is correct regarding the propagation of light of different colours of white light in air?</p> <p>(a) Red light moves fastest.</p> <p>(b) Blue light moves faster than green light.</p> <p>(c) All the colours of the white light move with the same speed.</p> <p>(d) Yellow light moves with the mean speed as that of the red and the violet light.</p>	1
14	<p>If an object is placed at 20 cm from a convex lens of focal length 10cm, the image will be</p> <p>(a) Real, enlarged</p> <p>(b) Real, diminished</p> <p>(c) Virtual, enlarged</p> <p>(d) Real, of same size as object</p>	1
15	<p>For verifying Ohm's law, we design an electric circuit diagram in which we show the arrangement of different circuit components. We find that with respect to the resistor, the:</p> <p>(a) Ammeter is connected in parallel and voltmeter in series</p> <p>(b) Ammeter is connected in series and voltmeter in parallel</p> <p>(c) Ammeter and voltmeter are both connected in series.</p> <p>(d) Ammeter and voltmeter are both connected in parallel</p>	1
16	<p>A student plots V – I graphs for three samples of nichrome wire with resistances R_1, R_2 and R_3. Choose from the following the statement that holds true for this graph.</p>  <p>(a) $R_1 = R_2 = R_3$</p> <p>(b) $R_1 > R_2 > R_3$</p> <p>(c) $R_3 > R_2 > R_1$</p> <p>(d) $R_2 > R_1 > R_3$</p>	1
<p>For Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</p> <p>(a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion(A).</p> <p>(b) Both Assertion (A) and Reason (R). are true, and Reason (R) is not the correct explanation of Assertion (A).</p> <p>(c) Assertion (A) is true but Reason (R) is false.</p> <p>(d) Assertion (A) is false but Reason (R) is true.</p>		

17	Assertion (A): The process of dissolving an acid or a base in water is highly exothermic reaction. Reason (R): Water must always be added slowly to acid with constant stirring.	1
18	Assertion (A): Pancreatic juice digests starch, proteins and fats. Reason (R): Pancreatic juice contains digestive enzymes trypsin for digesting fat.	1
19	Assertion (A): The purpose of making urine is to filter undigested food from intestine. Reason (R): Kidneys filter the waste and produce urine.	1
20	Assertion (A): The resistivity of a substance does not depend on the nature of the substance and temperature. Reason (R): The resistivity of a substance is a characteristic property of the material.	1
SECTION-B <i>Question No.21 to 26 are very short answer questions</i>		
21	(A) Draw the electron dot diagram for the formation of calcium chloride by transfer of electrons between chlorine (Atomic No: 17) and calcium (Atomic No: 20). OR (B) Write any four general properties of electrovalent compounds.	2
22	What do you mean by precipitation reaction? Give an example in the form of balanced chemical equation.	2
23	(A) (a) State the function of (i) Gustatory receptors (ii) Olfactory receptors (b) Identify the labelled parts R and S in the diagram given below  OR (B) (a) List any two body functions that will be affected if cerebellum gets damaged. (b) When some particles like sand falls into our eyes, our eyes water and we blink to get the particle out of our eyes. What is the specific name given to the pathway and which organ is involved during this process?	2
24	What is the fate of glucose molecule in (i) Anaerobic respiration in yeast (ii) Aerobic respiration in human cells. Write the pathway showing the breakdown of glucose.	2

25	<p>a) Define the power of a lens.</p> <p>b) Calculate the focal length of a lens of power – 2.5 D.</p>	2
26	<p>a) State ohm’s law. Write the mathematical expression for it.</p> <p>b) Why are coils of electric toasters and electric irons made of an alloy rather than a pure metal?</p>	2
<p>SECTION-C</p> <p><i>Question No. 27 to 33 are short answer questions</i></p>		
27	<p>State the reason:</p> <p>(a) Hydrogen gas is not evolved when a metal reacts with nitric acid.</p> <p>(b) Some metal oxides such as aluminium oxide, zinc oxide, are named as “amphoteric oxides”.</p> <p>(c) Sodium metal is kept immersed in kerosene oil.</p>	3
28	<p>You have four solutions A, B, C and D.</p> <p>The pH of solution ‘A’ is 2, ‘B’ is 10, ‘C’ is 13 and ‘D’ is 7.</p> <p>(a) Identify the most acidic and most basic solution.</p> <p>(b) Arrange the four solutions in increasing order of H⁺ ion concentration.</p> <p>(c) State the change in colour of pH paper on dipping in solution A and D.</p>	3
29	<p>(a) Name a plant hormone that promotes cell division and a hormone which inhibits growth.</p> <p>(b) Explain the mechanism involved in bending of a shoot tip due to stimulation by light.</p>	3
30	<p>We often hear people complain about ‘acidity’ in the stomach.</p> <p>(a) Over production of what substance is most likely the reason for the complaint? Why is the production of this substance necessary?</p> <p>(b) How does stomach prevent itself from the harmful effect of overproduction of this substance?</p> <p>(c) How is small intestine designed to absorb digested food?</p>	3
31	<p>(a) Draw a neat labelled diagram of human excretory system and label</p> <p>(i) The part where urine is stored.</p> <p>(ii) The part where urine produced in the kidney passes through.</p> <p>(b) List two factors on which the amount of water reabsorbed depends.</p>	3

32	<p>(A) A dentist uses a mirror in front of a decayed tooth at a distance of 4 cm from the tooth to get a 4 times magnified image in the mirror. Use mirror formula to find the focal length and state the type of the mirror used.</p> <p style="text-align: center;">OR</p> <p>(B) The refractive index of a medium 'X' with respect to a medium 'Y' is $\frac{2}{3}$ and the refractive index of medium 'Y' with respect to medium 'Z' is $\frac{4}{3}$. Find the refractive index of medium 'Z' with respect to medium 'X'. If the speed of light in medium 'X' is 3×10^8 m/s, calculate the speed of light in medium 'Y'.</p>	3
33	<p>A piece of wire of resistance 6Ω is connected to a battery of 12 V. Find the amount of current flowing through it. Now the same wire is redrawn by stretching it to double its length. Find the resistance of the new (redrawn) wire.</p>	3
<p>SECTION-D <i>Question No. 34 to 36 are long answer questions</i></p>		
34	<p>(A) Study the chemical reaction given below.</p> $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$ <p>a) What type of chemical reaction is this? Justify your answer.</p> <p>b) Food items containing oil and fat are flushed with nitrogen. Give reason.</p> <p>c) Write one chemical equation each for decomposition reaction where energy is supplied in the form of heat, light, or electricity.</p> <p style="text-align: center;">OR</p> <p>(B) On heating gypsum at 373K, it loses water molecule and becomes a white powder 'X' and on mixing with water, it changes to gypsum once again giving a hard solid mass.</p> <p>i) Identify the chemical name and chemical formula of 'X'.</p> <p>ii) Write the chemical equation to show the reaction between 'X' and water.</p> <p>iii). How many molecules of water of crystallisation is present in 'X'?</p> <p>iv) State any two uses of 'X'.</p>	5

35	<p>(A)a) A major portion of the carbohydrates produced by plants is stored in different parts of the plant (storage organs). Explain the mechanism by which this stored food is made available when different organs need it for growth.</p> <p>b) Arteries have thick elastic walls while veins have valves, explain.</p> <p>c) Name the smallest blood vessels and mention its function.</p> <p style="text-align: center;">OR</p> <p>(B)a) Mention the importance of transpiration in plants.</p> <p>b) Describe double circulation in human beings. How is it different from fishes?</p> <p>c) Name the blood vessels X and Y. write its function.</p> <div style="text-align: center;">  </div>	5
36	<p>(A)a) A ray of light passing through Centre of curvature of a concave mirror is incident on its reflecting surface. What is the angle of incidence and angle of reflection of this ray of light?</p> <p>b) List two reasons for using convex mirrors as rear-view mirrors in vehicles.</p> <p>c) An object 5 cm in length is placed at a distance of 20 cm in front of a convex mirror of radius of curvature 30 cm. Find the position and size of the image.</p> <p style="text-align: center;">OR</p> <p>(B) a) Explain why the planets do not twinkle.</p> <p>b) Draw a ray diagram to show the refraction of light through a glass prism. Mark the</p> <p>i) Incident ray ii) emergent ray iii) angle of deviation iv) angle of emergence</p>	5
<p>SECTION - E</p> <p><i>Question No. 37 to 39 are case-based/data -based questions with 3 short sub-parts. Internal choice is provided in one of these sub-parts.</i></p>		
37	<p>The chlor-alkali process is a widely used electrolytic process that has become the principal source of a gas that is used for disinfecting drinking water. It involves the electrolysis of aqueous sodium chloride in a membrane cell producing another gas also which burns with pop sound. During the process, one of these gases is formed at the negative electrode and the other gas at the positive electrode, leaving a solution of strong base used for the manufacture of soaps and detergents.</p>	4

	<p>a) Name the gases produced in the process mentioned.</p> <p>b) Which of the following is the chemical formula of the base produced? (i) $\text{Mg}(\text{OH})_2$ (ii) KOH (iii) NaOH (iv) CaOCl_2</p> <p>c) What would be your observations if the following indicators are added to the solution formed during the process? i) A drop of phenolphthalein ii) A drop of methyl orange</p> <p style="text-align: center;">OR</p> <p>c) Write a balanced chemical reaction that takes place when the two gases react with each other. The product so produced will turn blue litmus red only when wet, why?</p>	
38	<p>Hormones are chemical messengers that send signals to one or more tissues or organs in the body. They are part of the endocrine system, and the study of this system is known as endocrinology. They act on various tissues and organs in the body to change their behavior. The endocrine system uses hormones to control and coordinate our body's internal metabolism (or homeostasis) energy level, reproduction, growth and development, and response to injury, stress, and environmental factors. Often a bodily process involves a chain reaction of several different hormones.</p> <p>a) Name the male and female hormones which is associated with changes at puberty.</p> <p>b) Why is it advised to have iodised salt in our diet?</p> <p>c) How does our body responds when adrenaline is secreted into the blood?</p> <p style="text-align: center;">OR</p> <p>c) Explain feedback mechanism with an example.</p>	4
39	<p>Aditya, who was a back bencher in class, started complaining of frequent headaches. His parents took him to the nearest clinic and the doctor referred him to the eye specialist. The eye specialist tested his vision and asked Aditya whether he was able to read whatever the teacher wrote on the black board clearly or not. He replied in the negative. The doctor told his parents about the defect of vision that Aditya was suffering from and advised corrective glasses.</p> <p>a) What type of defect is Aditya suffering from?</p> <p>b) What are the causes of this defect?</p> <p>c) Draw the ray diagrams of the (i) defected eye of Aditya and (ii) correction for this defect.</p> <p style="text-align: center;">OR</p> <p>c) The far point of a myopic person is 50 cm in front of the eyes. What will be the power of the lens required to correct his problem?</p>	4