

Date:11/01/2023 GRADE: X	MODEL EXAMINATION (2022-23) SCIENCE	Max Marks:80 Total time :3hrs
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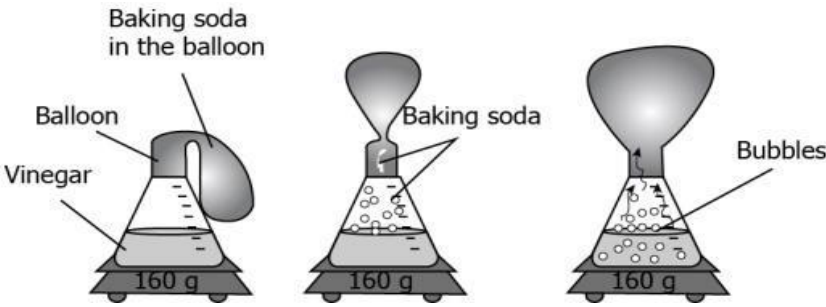
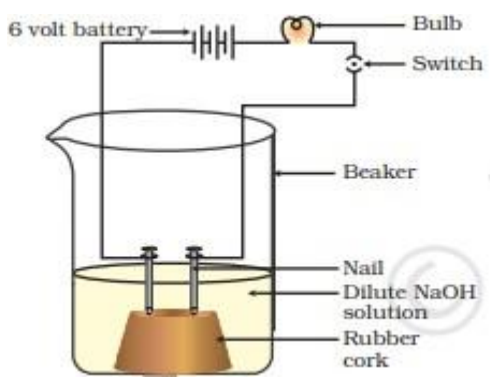
GENERAL INSTRUCTIONS:

- 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 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.

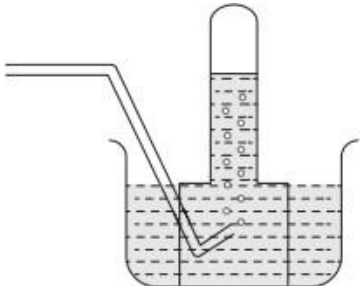
SECTION - A

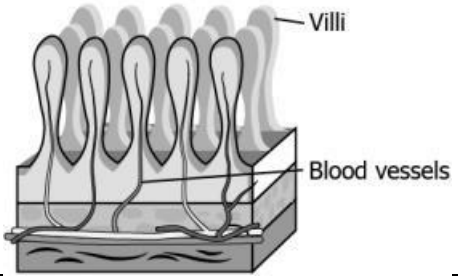
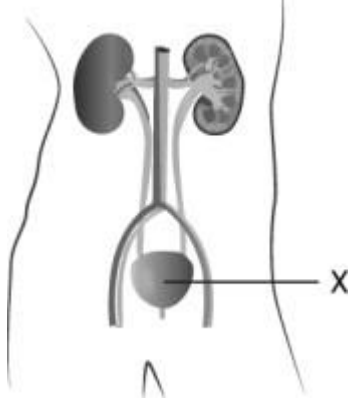
Select and write one most appropriate option out of the four options given for each of the questions 1 – 20

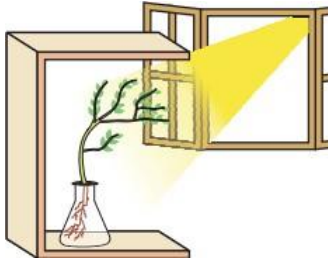
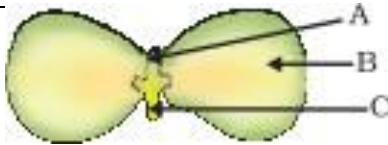
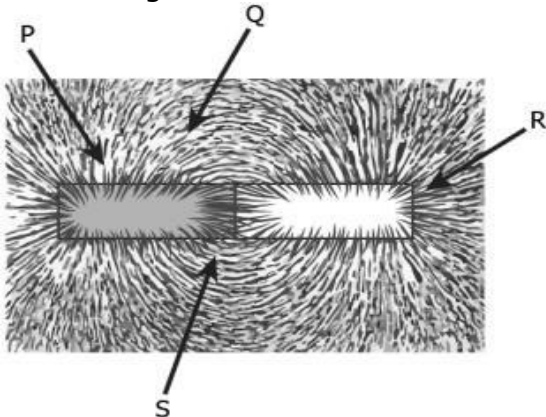
1.	Which of the statements about the reaction below are incorrect? $2\text{PbO}(s) + \text{C}(s) \rightarrow 2\text{Pb}(s) + \text{CO}_2(g)$ (i) Lead is getting reduced. (ii) Carbon dioxide is getting oxidised. (iii) Carbon is getting oxidised. (iv) Lead oxide is getting reduced.	1
	(a) (i) and (ii)	

	<p>(b) (i) and (iii) (c) (i), (ii) and (iii) (d) all</p>	
2.	<p>A student poured 100 ml of water in a bottle and added 40 ml vinegar to it. A balloon was filled with 20 g baking soda and was fixed at the mouth of the bottle. Slowly the shape of the balloon changed, as shown.</p>  <p>The student claims that a chemical change happened when the two substances were mixed. Is the claim made by the student correct?</p>	1
	<p>(a) Yes, as a new substance was formed in the form of a gas. (b) Yes, as the mass remains the same throughout the experiment. (c) No, as the formation of bubbles in the mixture shows a physical change. (d) No, as the change in the shape and size of the balloon shows a physical change.</p>	
3.	<p>In an attempt to demonstrate electrical conductivity through an electrolyte, the following apparatus was set up.</p>  <p>Which among the following statement(s) is(are) correct?</p> <p>(i) Bulb will not glow because electrolyte is not acidic (ii) Bulb will glow because NaOH is a strong base and furnishes ions for conduction. (iii) Bulb will not glow because circuit is incomplete (iv) Bulb will not glow because it depends upon the type of electrolytic solution</p>	1

	(a) (i) and (iii) (b) (ii) and (iv) (c) (ii) only (d) (iv) only	
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4.	Sodium carbonate is a basic salt because it is a salt of	1
	(a) strong acid and strong base (b) weak acid and weak base (c) strong acid and weak base (d) weak acid and strong base	
5.	A metal is treated with dilute sulphuric acid. The gas evolved is collected by the method shown in the figure.  <p>The name of the gas is</p>	1
	(a) Hydrogen (b) Oxygen (c) Nitrogen (d) Helium	
6.	Which of the following gives the correct increasing order of acidic strength?	1
	(a) Water < Acetic acid < Hydrochloric acid (b) Water < Hydrochloric acid < acid Acetic acid (c) Acetic acid < Water < Hydrochloric acid (d) Hydrochloric acid < Water < Acetic acid	
7.	Which among the following are unsaturated hydrocarbons? (i) $\text{H}_3\text{C} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$ (ii) $\text{H}_3\text{C} - \text{C} \equiv \text{C} - \text{CH}_3$ (iii) $\begin{array}{c} \text{H}_3\text{C} - \text{CH} - \text{CH}_3 \\ \\ \text{CH}_3 \end{array}$ (iv) $\begin{array}{c} \text{H}_3\text{C} - \text{C} = \text{CH}_2 \\ \\ \text{CH}_3 \end{array}$	1
	(a) (i) and (iii) (b) (ii) and (iii) (c) (ii) and (iv) (d) (iii) and (iv)	

8.	<p>The image shows a cross section of small intestine.</p>  <p>The diagram shows a cross-section of the small intestine. It features several finger-like projections called villi extending from the inner surface of the intestinal wall. Below the villi, a network of blood vessels is visible, with lines indicating their connection to the villi. Labels 'Villi' and 'Blood vessels' are present with leader lines pointing to the respective structures.</p>	1
	<p>What will be the likely happen if the number of villi increases in the intestine? (a) increase in the absorption of food (b) fast elimination of waste from the body (c) increase in flow of blood in the small intestine (d) fast breakdown of larger food particles into smaller ones</p>	
9.	<p>The image shows the excretory system in humans.</p>  <p>The diagram illustrates the human excretory system. It shows two kidneys located in the upper back, connected by ureters to a central bladder. The bladder is labeled with the letter 'X'. Below the bladder, the ureters lead to the urethra. The entire system is shown within a simplified outline of a human torso.</p> <p>What is the importance of the labelled part in excretory system?</p>	1
	<p>(a) It produces urine. (b) It filters waste from the blood. (c) It stores the urine till urination. (d) It carries urine from kidney to outside.</p>	
10.	<p>If a round, green seeded pea plant (RR yy) is crossed with wrinkled, yellow seeded pea plant, (rr YY) the seeds produced in F1 generation are</p>	1
	<p>(a) round and yellow (b) round and green (c) wrinkled and green (d) wrinkled and yellow</p>	

11.	<p>Akshay potted some germinated seeds in a pot. He put the pot in a cardboard box that was open from one side. He keeps the box in a way that the open side of box faces sunlight near his window. After 2-3 days he observes the shoot bends towards light as shown in image.</p>  <p>Which type of tropism he observes?</p>	1
	<p>(a) Geotropism (b) Phototropism (c) chemotropism (d) hydrotropism</p>	
12.	<p>In Figure. the parts A, B and C are sequentially</p>	1
		
	<p>(a) cotyledon, plumule and radicle (b) plumule, radicle and cotyledon (c) plumule, cotyledon and radicle (d) radicle, cotyledon and plumule</p>	
13.	<p>What is the relationship between resistance and current?</p>	1
	<p>(a) They are directly proportional to each other. (b) They are inversely proportional to each other. (c) The resistance has a greater magnitude than current. (d) The current has a greater magnitude than resistance.</p>	
14.	<p>A student places some iron fillings around a magnet. The iron fillings arrange themselves as shown in image.</p>  <p>The student labelled four different regions around the magnet. Where would be the magnetic be the strongest?</p>	1
	<p>(a) P (b) Q (c) R (d) S</p>	

15.	Electrical resistivity of a given metallic wire depends upon	1
	(a) its length (b) its thickness (c) its shape (d) nature of the material	
16.	The strength of magnetic field inside a long current carrying straight solenoid is	1
	(a) more at the ends than at the centre (b) minimum in the middle (c) same at all points (d) found to increase from one end to the other	
<p>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</p>		
17.	<p>Assertion: Decomposition of silver chloride into silver and chlorine is an exothermic process. Reason: Reactions in which energy is absorbed are known as endothermic reactions.</p>	1
18.	<p>Assertion: Each and every child has two versions of DNA -both paternal and maternal. Reason: Both father and mother contribute equal amounts of genetic materials to their child.</p>	1
19.	<p>Assertion: Simple diffusion does not meet high energy requirements of multi-cellular organisms Reason:In multi cellular organisms , all the cells may not be in direct contact with the surrounding environment.</p>	1

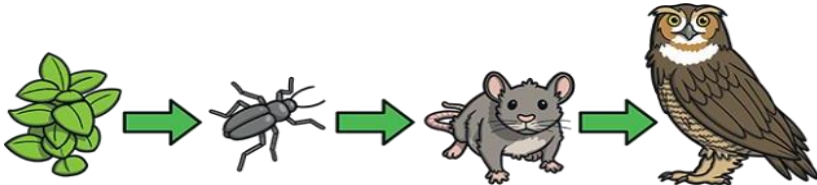
20.	<p>Assertion: Copper is used to make electric wires. Reason: Copper has very low electric resistance and conductivity.</p>	1
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SECTION – B
Q. no. 21 to 26 are very short answer questions.

21.	<p>A student took 2-3 g of a substance X in a glass beaker and poured water over it slowly. He observed bubbles along with hissing noise. The beaker becomes quite hot. The product 'Y' so obtained is used for white washing. Identify 'X' and 'Y'. What type of reaction is it? Write the balanced chemical equation for the reaction of 'X' with water.</p> <p style="text-align: center;">OR</p> <p>What are redox reactions? Identify the substance oxidised and reduced in the following reaction.</p> $3\text{MnO}_2 + 4\text{Al} \longrightarrow 3\text{Mn} + 2\text{Al}_2\text{O}_3$	2
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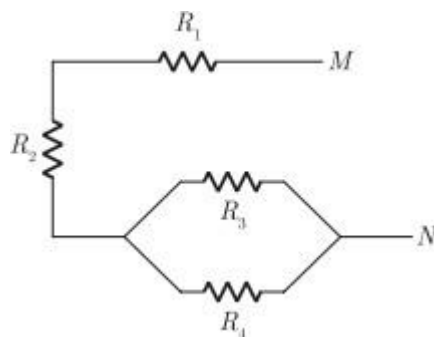
22.	<p>(a) Name the hormone which is secreted when growing plants detect light. Mention its site of secretion in a plant.</p> <p>(b) Explain why do plants appear to bend towards light?</p>	2
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23.	<p>Label parts (A), (B), (C) and (D) and show the direction of electric signals in the given figure.</p> <div style="text-align: center;"> <p>The diagram illustrates a reflex arc. A hand is shown touching a hot object (a cup). Receptors in the skin are labeled 'Receptors = heat/pain receptors in skin'. An arrow labeled 'A' points from the receptors towards the spinal cord. Inside the spinal cord, a 'Relay neuron' is shown. An arrow labeled 'B' points from the receptors to the relay neuron, and another arrow labeled 'C' points from the relay neuron towards the brain. An arrow labeled 'D' points from the brain back towards the spinal cord. A final arrow labeled 'message to brain' points from the brain towards the spinal cord.</p> </div>	2
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24.	Give reasons for the following: (a) Ventricles have thicker muscular walls than atria. (b) Transport system in plants is slow.	2
25.	What is a rainbow? Draw a labelled diagram to show the formation of a rainbow. OR How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw the diagram.	2
26.	Observe the given food chain: Gras \longrightarrow Insect \longrightarrow rat \longrightarrow Owl  (a) At which trophic level insect and owl are in the food chain. (b) If the energy available to rat is 200J ,what is the energy available to insect and owl? Why?	2
SECTION - C Q.no. 27 to 33 are short answer questions.		
27.	Consider the following chemical equation: $X + \text{Barium chloride} \longrightarrow Y (\text{white ppt}) + \text{sodium chloride}.$ Identify: (a) X and Y (b) The type of reaction. (c) Write balanced chemical equation for another reaction of the same type.	3
28.	(a) Arrange the metals Zn, Mg, Al, Cu and Fe in decreasing order of reactivity. (b) What would you observe when you put: (i) Some zinc pieces into blue copper sulphate solution. (ii) Some copper pieces into green ferrous sulphate solution.	3
29.	(i) What is the role of mucus in stomach? (ii) How exit of food from the stomach is regulated? (iii) Where does food enter from stomach? OR Write one function of each of the following components of the transport system in human beings (a) Blood vessels (b) Lymph (c) platelets	3
30.	What is meant by power of a lens? Write its SI unit. A student uses a lens of focal length 40 cm and another of -20 cm. Write the nature and power of each lens.	3
31.	The image formed by a spherical mirror is real, inverted and is of magnification-2 . If the image is at a distance of 30 cm from the mirror, where is the object placed ? Find the focal length of the mirror. List two characteristics of the image formed if the object is moved 10 cm towards the mirror.	3

32.	(a) What is a solenoid? Draw the magnetic field lines of the field produced due to a current carrying solenoid. (b) State the law used to find the direction of magnetic field around a straight current carrying conductor.	3
33.	What is ozone? How is it formed? How depletion of ozone is a cause of concern for us?	3
SECTION - D Q.no. 34 to 36 are Long answer questions		
34.	(a) Draw the structure of ethanoic acid. (b) Name the compound formed when ethanol is heated with ethanoic acid in the presence of conc. H_2SO_4 . Write the balanced chemical equation. (c) Complete the following equations : $CH_4 + Cl_2 \xrightarrow{\text{sunlight}}$ $C_2H_5OH + O_2 \xrightarrow{\text{combustion}}$	5
OR		
35.	(a) Redraw the given figure and label the parts. <div style="text-align: center;">  </div> (i) Production of egg (ii) Site of fertilisation (iii) Site of implantation (iv) Entry of the sperms (b) Reproduction is linked to stability of population of a species. Justify the statement. (c) What are the benefits of using mechanical barriers as contraception? OR (a) How does pollination is different from fertilisation? (b) Mention the site and product of fertilisation in a flower. (c) Draw a diagram of its longitudinal section showing the process of germination of pollen on stigma and label the following on it : (i) Male germ cell (ii) female germ cell (iii) ovary (iv) pollen tube	5

36. (a) For the combination of resistors shown in the following figure, find the equivalent resistance between M and N if $R_1=R_2=R_3=R_4=4\ \Omega$



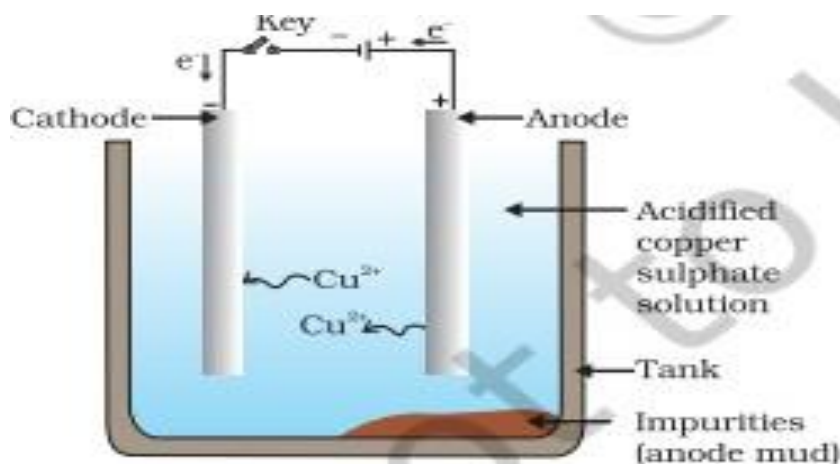
- (b) State Joule's law of heating.
 (c) Why we need a 10 A fuse for an air conditioner which consumes 2 kW power at 220 V power source?
 (d) Why is it impracticable to connect an electric bulb and an electric heater in series?

5

SECTION - E

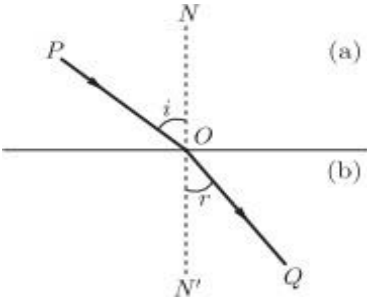
Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.

37. Refining is the process of purification of metals. One of the important method of refining is electrolysis. In electrolysis, electrical energy is used to bring about a non-spontaneous redox reaction. This is done by passing an electric current through a liquid containing ions, known as an electrolyte. In contrast to metals, the current in electrolytes is carried by the movement of ions rather than the movement of electrons. The solid conductors inserted into the liquid are called electrodes, the one with a positive charge is called the anode (because it attracts anions) and the one with the negative charge is called the cathode. A diagrammatic representation of electrolysis of copper is shown below :



- (i) Name the electrolyte used in refining of copper.
 (ii) What is anode mud ?
 (iii) Name two metals which can be refined by electrolytic method other than copper. What is taken as anode and cathode during electrolytic refining of copper?

4

	<p style="text-align: center;">OR</p> <p>What happens at cathode and anode during electrolytic refining of copper? Write equations for the above changes.</p>									
38.	<p>Refer to the given table regarding results of F₂ generation of Mendelian cross.</p> <table border="1" data-bbox="293 279 1463 527"> <tr> <td>Plants with round and yellow coloured seeds (P)</td> <td>315</td> </tr> <tr> <td>Plants with round and green coloured seeds (Q)</td> <td>108</td> </tr> <tr> <td>Plants with wrinkled and yellow coloured seeds (R)</td> <td>101</td> </tr> <tr> <td>Plants with wrinkled and green coloured seeds (S)</td> <td>32</td> </tr> </table> <p>(i) What would be the phenotype of F₁ generation regarding given data of F₂ generation? (ii) What would be the genotype of parental generation regarding the given result of F₂ generation? (iii) If a plant with wrinkled and green coloured seeds (S) is crossed with the plant having wrinkled and yellow coloured seeds (R), what will be the probable phenotype of offsprings?</p> <p style="text-align: center;">OR</p> <p>What will result when plant YyRr is self-pollinated? (Show cross only)</p>	Plants with round and yellow coloured seeds (P)	315	Plants with round and green coloured seeds (Q)	108	Plants with wrinkled and yellow coloured seeds (R)	101	Plants with wrinkled and green coloured seeds (S)	32	4
Plants with round and yellow coloured seeds (P)	315									
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Plants with wrinkled and green coloured seeds (S)	32									
39.	<p>When light ray goes from one transparent medium to another transparent medium, it suffers a change in direction, into second medium. The extent of the change in direction suffered by the phenomenon of change in the path of light rays when going from one medium to another medium is known as refraction. Refraction in a given pair of media can be expressed in terms of refractive index. The refractive index is related to an important physical quantity in the relative speed of light in different media.</p> <p>(i) A ray of light enters into the medium 'b' from medium 'a'. If angle $i = 45^\circ$ and angle $r = 40^\circ$, which medium is denser and why?</p> <div style="text-align: center;">  <p>The diagram shows a horizontal line representing the interface between two media, (a) above and (b) below. A vertical dashed line NN' represents the normal. A light ray PQ passes through point O on the interface. The ray is incident from medium (a) at an angle i to the normal and refracts into medium (b) at an angle r to the normal.</p> </div> <p>(ii) What is absolute refractive index? (iii) Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass? The speed of light in vacuum is 3×10^8 m/s</p> <p style="text-align: center;">OR</p> <p>Refractive index of diamond with respect to glass is 1.6 and absolute refractive index of glass is 1.5. Find out the absolute refractive index of diamond.</p>	4								

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