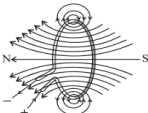




SINDHI HIGH SCHOOL
HALF YEARLY [2023-24]
SUBJECT: SCIENCE ANSWER KEY

Grade: X

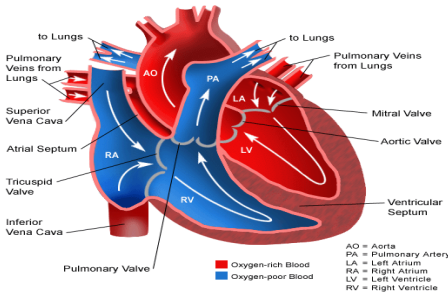
Date: 25.09.2023

	Section A	
	Section A consists of 20 questions of 1 mark each.	
1C	(b) Lead acetate	1
2C	(b) $2\text{HCl} + \text{Ba}(\text{OH})_2 \rightarrow \text{BaCl}_2 + 2\text{HOH}$	1
3C	(d) d	1
4C	(c) gypsum and slacked lime	1
5C	(b) HCl	1
6C	(d) Lemon juice	1
7C	(c) methyl orange: Red, phenolphthalein: colourless	1
8B	(B) The water consumed by the individual	1
9B	(C) The upward movement of water through xylem becomes discontinuous affecting the growth of plants.	1
10 B	(B) quick responses	1
11 B	(C) Blood from the extremities is diverted to the digestive system due to contraction.	1
12 B	(B) Organisms need not depend on being cut to reproduce	1
13 P	(B) 0.06A	1
14 P	(C) 	1
15 P	(B) (i) $Q = I \times t$ (ii) $W = V \times Q$	1
16 P	(A) high power rating such as geyser	1

17 C	(d) Assertion is incorrect but Reason is correct	1									
18 B	(B) Both Assertion (A) and Reason (R) are true but R is not the correct explanation of A	1									
19 P	(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	1									
20 B	(A) Both A and R are true, and R is the correct explanation of A.	1									
Section B											
Section B consists of 6 questions of 2 marks each.											
21 C	a) baking soda releases carbon di oxide gas upon heating which makes the cake batter to rise and become fluffy. b) pH of baking soda is more than 7 as it is a basic salt due to being the product of salt of a strong base and a weak acid.	1 1									
22 B	<p>Abscission – Abscissic acid Growth – auxin Cell division – cytokinin Stem elongation – gibberellin (students should write the function and the hormone related in order to allot full marks)</p> <p style="text-align: center;">OR</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Hormone</th><th style="text-align: left;">Function</th><th style="text-align: left;">Deficiency</th></tr> <tr> <td>Thyroxin</td><td>Regulates carbohydrate, protein, and fat metabolism</td><td>Hypothyroidism / goiter</td></tr> <tr> <td>Growth</td><td>Regulates growth</td><td>Dwarfism</td></tr> </table>	Hormone	Function	Deficiency	Thyroxin	Regulates carbohydrate, protein, and fat metabolism	Hypothyroidism / goiter	Growth	Regulates growth	Dwarfism	2 0.5x4=2
Hormone	Function	Deficiency									
Thyroxin	Regulates carbohydrate, protein, and fat metabolism	Hypothyroidism / goiter									
Growth	Regulates growth	Dwarfism									
23 B	a) No absorption of digested food by blood vessels b) Cellulose is difficult to digest. If the intestine is small the digestion if cellulose is affected c) Pancreatic enzymes will not be functional as the food reaching the intestine will be in acidic medium d) The acid present in stomach will affect the lining of the stomach	2 (0.5) 0.5 0.5 0.5									
24 P	A)solenoid is a coil containing many circular turns wrapped closely in the shape of a cylinder. A solenoid acts as a magnet when a current is supplied through it. The strength of the magnetic field around a solenoid can be increased by: <ul style="list-style-type: none"> • increasing the number of turns on the coil. • increasing the current. • decrease the radius of the coil placing an iron core inside the solenoid. <p style="text-align: center;">(Any one)</p>	1 0.5 0.5									

25 P	<p>As both wires are of the same length and same diameter, Resistance is proportional to resistivity.</p> <p>Here in VI graph Slope of line B is greater (steeper than) Slope of line A. $\Rightarrow R_B > R_A \Rightarrow \rho_B > \rho_A$. Thus, Resistivity of B is higher than Resistivity of A</p> <p style="text-align: center;">OR</p> <p>The current also decreases to one fourth of its initial value.</p> <p>It governs Ohm's law which states that the potential difference across a conductor is directly proportional to the current through it, provided temperature and all other physical conditions, remain constant.</p>	<p>0.5</p> <p>1</p> <p>0.5</p> <p>1</p> <p>1</p>
26 B	<p>(i) A and B are unisexual flowers. Or A is a male flower, b is female flower. C is a bisexual flower</p> <p>(ii) A and B undergo cross pollination C undergoes both cross pollination and self-pollination</p>	<p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p>
	Section C	
	Section C consists of 7 questions of 3 marks each.	
27 C	<p>These solutions can be kept in copper container.</p> <p>Because copper is a less reactive metal which does not react with the given solutions.</p> <p>Whereas aluminium being more reactive than the given solutions displace hydrogen gas from the solutions.</p> <p>However, Water can be stored in both copper and aluminium containers as they both do not react with water at general conditions.</p>	<p>3 (0.5)</p> <p>1</p> <p>1</p> <p>0.5</p>
28 C	<p>(a) i) Na_2SO_4 = Acid H_2SO_4; Base NaOH ii) NH_4Cl = Acid HCl; Base NH_4OH iii) KNO_3 = Acid HNO_3; Base KOH iv) NaCl = Acid HCl; Base NaOH</p> <p>b) NH_4Cl will have pH less than 7 as it is formed by a strong Acid HCl and weak Base NH_4OH. It will be an acidic salt.</p> <p style="text-align: center;">OR</p> <p>a) The electrolysis of a concentrated solution of sodium chloride (brine) is known as chlor-alkali process. $2\text{NaCl} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{Cl}_2 + \text{H}_2$</p> <p>b) Sodium hydroxide- It is used in the manufacturing of paper. Chlorine - It is used to make plastics, pesticides, chlorofluorocarbon, carbon tetrachloride, Paints e.t.c. Hydrogen- It is used in the rocket fuel, manufacturing of ammonia for fertilizers, hydrogenation of oils to obtain vegetable ghee (any one use of each)</p>	<p>0.5</p> <p>0.5</p> <p>0.5</p> <p>0.5</p> <p>0.5+0.5</p> <p>0.5</p> <p>1</p> <p>1+0.5</p>
29 B	<p>a) to facilitate the reabsorption of useful materials by the blood. It also helps in secreting back the salts and waste materials into the filtrate.</p> <p>b) depending on the environmental conditions and the need of the plant</p> <p>c) yeast undergoes anaerobic respiration and amoeba undergoes aerobic respiration</p>	<p>3</p> <p>1+1+1</p>

	direction of current, then the thumb will indicate the direction of motion of conductor.	
33 P	<p>(A) The type of current used in microwave oven is alternating current (A.C.), which is different from the direct current (D.C.) given by a car battery. The key differences between the two types of current are as follows:</p> <ul style="list-style-type: none"> • A.C. changes direction periodically, while D.C. flows in only one direction. • The voltage of A.C. can be easily increased or decreased with the help of a transformer, while D.C. cannot. • A.C. is more suitable for the long-distance transmission of power with less power loss, while D.C. is more suitable for low-voltage applications and D.C. has higher power loss due to resistance. • A.C. can be easily converted into high voltages for transmission over long distances, and then converted back into low voltages for household use. <p>(B) An electric fuse acts as a safety device which prevents the electric circuit and appliances from possible damage due to short-circuiting or overloading by breaking the circuit when there is a current surge. The fuse wire melts when the current exceeds a safe limit, thereby breaking the circuit and preventing any damage to the appliances or the circuit. It works on the principle of JOULE'S LAW OF HEATING.</p>	<p>3</p> <p>0.5+0.5</p> <p>(Any two)</p> <p>0.5+0.5</p>
	Section D consists of 2 question of 5 mark	
34 C	<p>i) Since the zinc dust has a larger surface area than zinc granules. If the same amount of zinc dust is taken in the test tube then the reaction will be comparatively faster and hydrogen gas will evolve with greater speed.</p> <p>ii) With dilute hydrochloric acid, almost the same amount of gas is evolved.</p> <p>iii. With copper turnings, hydrogen gas will not evolve because copper is less reactive and it will not displace hydrogen from the acid. Hence, no reaction will take place.</p> <p>iv. Zinc also reacts with NaOH. So, if sodium hydroxide is taken, then hydrogen gas will be evolved.</p> $\text{Zn(s)} + 2\text{NaOH(aq)} \rightarrow \text{Na}_2\text{ZnO}_2\text{(aq)} + \text{H}_2\text{(g)}$ <p style="text-align: center;">OR</p> <p>i. H_2SO_4 test tube i.e., A will show vigorous reaction.</p> <p>ii. It is because H_2SO_4 is strong acid than H_2CO_3.</p> <p>iii. Hydrogen gas will be formed. Bring a burning splinter near the gas. It will burn with a 'pop' sound. It shows gas liberated is hydrogen.</p> <p>iv. $\text{Mg} + \text{H}_2\text{SO}_4 \rightarrow \text{MgSO}_4 + \text{H}_2$ $\text{Mg} + \text{H}_2\text{CO}_3 \rightarrow \text{MgCO}_3 + \text{H}_2$</p> <p>v. a. Since H_2SO_4 is more acidic A will have lower pH. b. H_2CO_3 is a weak acid B will have lower concentration of H^+</p>	<p>5</p> <p>1+1+1+2</p>

<p>35 B</p>	<p style="text-align: center;">Normal Heart</p>  <p>Human heart has four chambers where the oxygenated and deoxygenated blood is separated by the septum. But the heart of amphibian is 3 chambered, wherein the oxygenated and deoxygenated blood is separate. b) residual volume provides extended time for absorption of oxygen. Respiratory pigment increases efficiency of absorption due to its affinity to oxygen</p> <p style="text-align: center;">OR</p> <p>Aim: to prove that sunlight is necessary for photosynthesis Materials required : A destarched potted plant ,black strips, iodine solution , waterbath, alcohol, water, Procedure: Take a detached potted plant and place it in the sunlight after covering a leaf with a black strip After 2 hours, remove the leaf and boil it in water for 15 minutes and transfer it into a waterbath containing alcohol . After all the chlorophyll dissolves, place the leaf on a petridish and add few drops of iodine, The region of the leaf which was exposed to sunlight turns bluish black. Inference: Sunlight is required for photosynthesis</p> <p>b) photosynthesis process provides food source for all other living organisms.</p>	<p>5 Diagram 1 Arrows 1 Labelling 1(any 2)</p> <p>1</p> <p>0.5+0.5</p> <p>4</p> <p>1</p>
<p>36 P</p>	<p>(A) (i) No. The resistance of the bulbs in series will be three times the resistance of single bulb. $R_s = R + R + R = 3R$ The resistance of the bulbs in parallel will be one-third of the resistance of a single bulb. $\frac{1}{R_p} = \frac{1}{R} + \frac{1}{R} + \frac{1}{R} = \frac{3}{R} \Rightarrow R_p = \frac{R}{3}$ Therefore, the current in the series combination will be one-third compared to current in each bulb in parallel combination. OR The parallel combination bulbs will glow more brightly than series combination as current in the parallel combination will be three times the current through each bulb in series connection. Therefore, each bulb in parallel combination glows 3 times brighter to that of each bulb in series combination</p> <p>(ii) The bulbs in series combination will stop glowing as the circuit is broken and current is zero. However the bulbs in parallel combination shall continue to glow with the same Brightness as current gets divided and the work INDEPENDENTLY.</p> <p>(iii) Conductor C is made of constantan (alloy of copper and nickel) is preferred to Conductor A copper for making heating element constantan has higher</p>	<p>5 0.5+0.5 0.5 0.5 1+1</p>

	<p>resistivity and doesn't get oxidized even at high temperatures.</p> <p style="text-align: center;">OR</p> <p>(a) Faults in the given circuits</p> <p>(i) Black insulation wire is used for earth wire.</p> <p>(ii) Main fuse is connected with the neutral wire.</p> <p>(iii) Insulation of neutral wire is green.</p> <p>(iv) In distribution box, neutral wire is distributed for various circuits and fuses are also connected with neutral wire.</p> <p style="padding-left: 40px;">(i) Earth wire is connected with live and neutral wire.</p> <p style="padding-left: 40px;">(ii) The Socket for electric iron has No Earthing connection</p> <p>(b) Correction needed for given circuit</p> <p>(i) Earth wire should be of green insulation instead of black colour.</p> <p>(ii) Main fuse must be connected with live wire.</p> <p>(iii) Neutral wire should be of black insulation instead of a green colour.</p> <p>(iv) In distribution box, live wire should be distributed for various circuits and all the fuses in distribution box must be connected with live wire.</p> <p>(iii) Earth wire must not be connected with the live wire or neutral wire.</p> <p>(iv) The Socket for electric iron must have Earthing connection</p>	<p>0.5+0.5</p> <p>Any 5 each 0.5x10=5</p>
	SECTION E	
	Section E consists of two Case study of 4 marks	
37 C	<p>i. Hydrogen gas released at the cathode and Oxygen gas is released at anode</p> <p>ii. The mole ratio of hydrogen and oxygen gases liberated during the electrolysis of water is 2:1.</p> <p>iii. Here two moles of water undergo electrolysis and produce two moles of hydrogen and one mole of oxygen gas. Because the water molecule contains two hydrogens and one oxygen in its molecular formula. Therefore, after electrolysis of water volume of one gas collected at one electrode is double (hydrogen gas) of the gas collected at the anode (oxygen gas).</p> <p style="text-align: center;">OR</p> <p>Water is a bad conductor of electricity. So, when a direct current is passed through the water it won't conduct. Therefore to make the electrolysis happen, a few drops of sulphuric acid (H₂SO₄) to the water in the electrolysis of water</p> <p>AT CATHODE - $2\text{H}^+(\text{aq.}) + 2\text{e}^- \rightarrow \text{H}_2(\text{g})$</p> <p>AT ANODE- $2\text{OH}^-(\text{aq}) \rightarrow \frac{1}{2}\text{O}_2(\text{g}) + \text{H}_2\text{O}(\text{l}) + 2\text{e}^-$</p>	<p>4</p> <p>1+1+2</p>
38 B	<p>a) cerebrum</p> <p>b) The brain is protected by cranium – hard bony skull and the meninges. The cerebro spinal fluid protects from external shocks.</p> <p>C) The patient may not lose his reflexes as the spinal cord is not affected. the loss of sense may be a possibility as the cerebrum has controlling centers for all sense organs</p> <p>D) If the medulla oblongata is affected the involuntary functions like bloodpressure, salivation will be affected</p> <p style="text-align: center;">OR</p> <p>The cerebellum of the brain is affected due to alcohol, hence a person under the influence of alcohol cannot walk straight</p>	<p>4 (0.5) 0.5+0.5+0.5</p> <p>0.5+0.5</p> <p>1</p>

39 P	<div>(a)</div> <div> </div> <div> <p>(b) The tangent at any point on the magnetic field line gives the direction of the magnetic field at that point.</p> <p>(c) The relative Strength of the magnetic field maximum at the poles as the magnetic field lines are crowded at the poles</p> <div> </div> <div> <p>Pole P is NORTH and Q is SOUTH is pole as the lines of force are originating from P and terminating at Q</p> </div> <div> <p>OR</p> </div> <div> <p>Freely suspended magnet rests in North – South direction as Earth acts as a huge bar magnet. The Earth’s magnetic North pole is towards geographical south pole and its magnetic south pole is towards geographical north pole. Thus, our magnet get attracted with unlike pole of the Earth’s Magnet</p> </div> </div>	<div> 4 1 </div> <div>1</div> <div>1</div> <div>1</div>
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