



## INDIAN SCHOOL AL WADI AL KABIR

### FIRST REHEARSAL EXAMINATION-2023-24

CLASS: X  
DATE: 30-11-2023

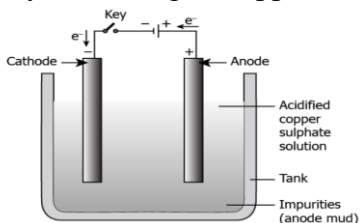
Sub: SCIENCE (086)  
Set -I

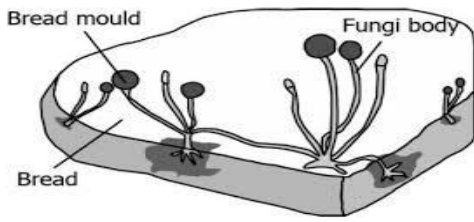
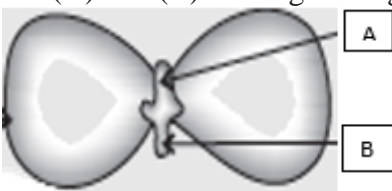
MAX.MARKS: 80  
TIME: 3 HOURS

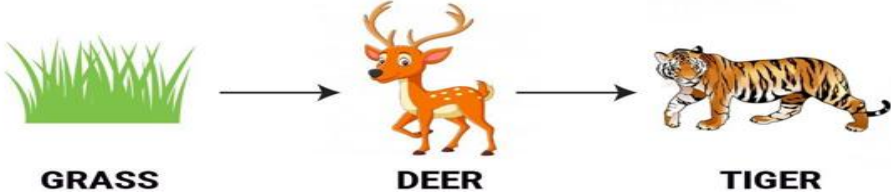
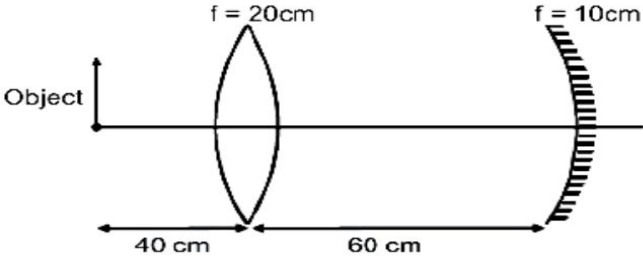
#### General Instructions:

- This question paper consists of 39 questions in 5 sections.
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- Section A consists of 20 objective type questions carrying 1 mark each.
- 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.
- 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.
- Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
- Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts

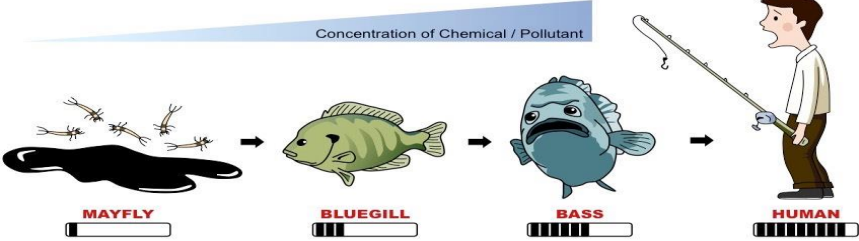
SECTION - A		
Select and write one most appropriate option out of the four options given for each of the questions 1 – 20		
Q. No	Questions	Marks
1	<p>A student performs an experiment to form a precipitate of Barium sulphate from Barium chloride and Sodium sulphate. Which of the following options gives the correct chemical equation of the reaction?</p> <p>(a) <math>\text{BaCl} + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + \text{NaCl}_2</math></p> <p>(b) <math>\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{Ba}(\text{SO}_4)_2 + \text{NaCl}_2</math></p> <p>(c) <math>\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{NaCl}</math></p> <p>(d) <math>\text{BaCl} + \text{NaSO}_4 \rightarrow \text{BaSO}_4 + \text{NaCl}</math></p>	1
2	<p>A student learns that some products are formed as a result of combining two compounds while some compounds are formed as a result of the dissociation of one compound. The image shows two reactions.</p> <p style="text-align: center;"><b>Reaction P- <math>\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2</math></b></p> <p style="text-align: center;"><b>Reaction Q- <math>\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2</math></b></p> <p>Identify the correct option from the following</p> <p>(a) Both reactions are examples of combination reaction.</p> <p>(b) Both reactions are examples of a decomposition reaction.</p>	1

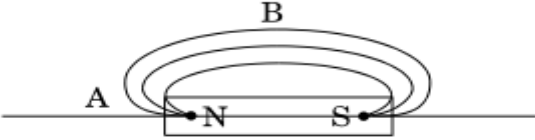
	<p>(c) Reaction P is an example of a combination reaction, while reaction Q is an example of a decomposition reaction.</p> <p>(d) Reaction P is an example of a decomposition reaction, while reaction Q is an example of a combination reaction.</p>									
3	<p>Which of the following are present in a dilute aqueous solution of hydrochloric acid?</p> <p>(a) <math>\text{H}_3\text{O}^+</math> and <math>\text{Cl}^-</math></p> <p>(b) <math>\text{H}_3\text{O}^+</math> and <math>\text{OH}^-</math></p> <p>(c) <math>\text{Cl}^-</math> and <math>\text{OH}^-</math></p> <p>(d) Unionised HCl</p>	1								
4	<p>Preethi has aqueous solutions of four different salts; Ammonium chloride, Ammonium acetate, Sodium chloride and Sodium carbonate. On checking the pH of the solutions, she finds that one of the solutions is acidic in nature. The acidic salt solution is:</p> <p>(a) Ammonium chloride solution</p> <p>(b) Ammonium acetate solution</p> <p>(c) Sodium chloride solution</p> <p>(d) Sodium carbonate solution</p>	1								
5	<p>The electronic configurations of three elements X, Y and Z are as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Element</th> <th>Electronic configuration</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>2,4</td> </tr> <tr> <td>Y</td> <td>2,7</td> </tr> <tr> <td>Z</td> <td>2,1</td> </tr> </tbody> </table> <p>Out of the three elements, two elements will combine to form an ionic compound and the correct formula of the compound is:</p> <p>(a) <math>\text{X}_2\text{Y}</math></p> <p>(b) <math>\text{YZ}</math></p> <p>(c) <math>\text{XZ}_3</math></p> <p>(d) <math>\text{Y}_2\text{Z}</math></p>	Element	Electronic configuration	X	2,4	Y	2,7	Z	2,1	1
Element	Electronic configuration									
X	2,4									
Y	2,7									
Z	2,1									
6	<p>The highly reactive metals like Sodium, Potassium, Magnesium, etc. are extracted by the</p> <p>(a) electrolysis of their molten chloride</p> <p>(b) electrolysis of their molten oxides</p> <p>(c) reduction by Aluminium</p> <p>(d) reduction by Carbon</p>	1								
7	<p>The image shows the electrolytic refining of copper.</p> 	1								

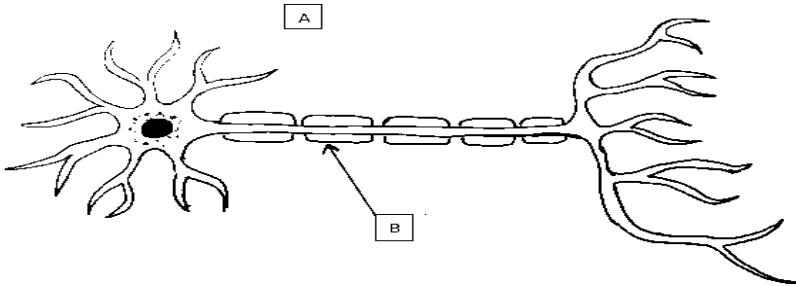
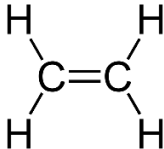
	<p>Identify the correct option regarding electrolytic refining of copper.</p> <p>(a) When current is passed, pure copper from the cathode deposits at the anode.</p> <p>(b) When current is passed, pure copper from the anode deposits in the electrolytic solution.</p> <p>(c) When current is passed, pure copper from the electrolytic solution deposits at the anode.</p> <p>(d) When current is passed, pure copper from anode moves into the electrolytic solution and then deposits at the cathode.</p>	
8	<p>Choose the correct path of urine in our body.</p> <p>(a) Kidney →ureter →urethra →urinary bladder</p> <p>(b) Kidney →urinary bladder →urethra →ureter</p> <p>(c) Kidney →ureter →urinary bladder →urethra</p> <p>(d) Urinary bladder →kidney →ureter →urethra</p>	1
9	<p>The image shows the bread moulds on a bread. How these fungi obtain nutrition?</p>  <p>(a) By using nutrients from the bread to prepare their own food.</p> <p>(b) By allowing other organisms to grow on the bread and then consuming them.</p> <p>(c) By breaking down the nutrients of bread and then absorbing them.</p> <p>(d) By eating the bread on which it is growing.</p>	1
10	<p>Identify the parts labelled (A) and (B) in the given figure –</p>  <p>(a) 'A' Plumule and 'B' Radicle</p> <p>(b) 'A' Radicle and 'B' Plumule</p> <p>(c) 'A' Cotyledon and 'B' Plumule</p> <p>(d) 'A' Cotyledon and 'B' Radicle</p>	1
11	<p>The correct sequence of reproductive stages seen in flowering plants are</p> <p>(a) gametes, zygote, embryo, seedling</p> <p>(b) zygote, gametes, embryo, seedling</p> <p>(c) seedling, embryo, zygote, gametes</p> <p>(d) gametes, embryo, zygote, seedling</p>	1

12	<p>What will happen if deer is missing from the food chain given below?</p>  <p>(a) The population of tiger will increase.  (b) Tiger will start eating grass.  (c) The population of grass decrease.  (d) Population of tiger decrease and grass increases.</p>	1
13	<p>A converging lens of focal length 20 cm is placed between an object &amp; a concave mirror of focal length 10 cm as shown in figure. The final image is:</p>  <p>(a) Coinciding with object enlarged, inverted, real  (b) Coinciding with object same size, erect, virtual  (c) Coinciding with object same size, inverted, virtual  (d) Coinciding with object same size, inverted, real</p>	1
14	<p>Blue colour of the sky and twinkling of stars are due to</p> <p>(a) Reflection and Atmospheric refraction of sunlight.  (b) Scattering and Atmospheric refraction of sunlight.  (c) Dispersion and scattering of sunlight.  (d) Atmospheric refraction and dispersion of sunlight.</p>	1
15	<p>Which of the following is the phenotype ratio of the F<sub>2</sub> generation in dihybrid crosses?</p> <p>(a) 1 : 3 : 1  (b) 1 : 2 : 1  (c) 9 : 3 : 3 : 1  (d) 1 : 3 : 3 : 1</p>	1
16	<p>Which of the following is a plant hormone?</p> <p>(a) Insulin  (b) Thyroxin  (c) Oestrogen  (d) Cytokinin</p>	1
<p><b>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:</b></p>		

(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	<b>Assertion(A):</b> When zinc is added to a solution of Iron (II) sulphate, no change is observed. <b>Reason (R):</b> - Zinc is more reactive than iron.	1
18	<b>Assertion(A):</b> The opening and closing of the pore is a function of the guard cells. <b>Reason (R):</b> The guard cells swell when water flows into them, causing the stomatal pore to open. Similarly, the pore closes if the guard cells shrink.	1
19	<b>Assertion(A):</b> Strength of an electromagnet can be increased by decreasing the number of turns per unit length in solenoid coil. <b>Reason (R):</b> Strength of an electromagnet can be increased by increasing the current flowing through the solenoid.	1
20	<b>Assertion(A):</b> When a nerve impulse reaches the muscle, the muscle fibre moves. <b>Reason (R):</b> Muscle cells have special minerals that change both their shape and their arrangement in the cell in response to nervous electrical impulses.	1
<b>SECTION – B</b> <b>Q. no. 21 to 26 are very short answer questions</b>		
21	Study the following equation of a chemical reaction: $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$ (i) Identify the type of reaction. (ii) Write a balanced chemical equation of another example of this type of reaction.	2
22	What is reproduction? What are the two types? Which one confers new characteristics on the offspring and how? <b>OR</b> Name plants bearing unisexual flowers and bisexual flowers. Give two examples of each.	2
23	In a food chain comprising of snake, grasshopper, grass and frog, 30,000 joules of energy is available to the producer. How much energy will be available to secondary consumer to transfer it to the tertiary consumer? Also draw a relevant food chain before solving the problem.	2
24	Rekha is looking at herself in a convex mirror in a science museum, standing 2 m away from the mirror. Her image appears to be around half her actual height. Estimate the focal length of the mirror. <b>OR</b>	2

	At what distance from a concave lens of focal length 20 cm, a 6 cm tall object be placed so as to obtain its image at 15 cm from the lens?	
25	a) State the law that explains the heating effect of current with respect to the measurable properties in an electrical circuit. b) List any two factors on which the resistance of a conductor depends.	2
26	Identify and define the phenomenon you observe in the figure given below -  	2
<b>SECTION - C</b>		
<b>Q.no. 27 to 33 are short answer questions.</b>		
27	What is the difference between Electrolytic reduction and Reduction using carbon? Give one example of each.	3
28	An element X with electronic configuration 2,8,2 reacts with Cl atom. Write the chemical formula of the compound formed. Show the formation of the compound using electron dot structures. Write any one property of such type of compounds.  <b>OR</b> (a) Write the steps involved in the extraction of pure metals in the middle of the activity series from their carbonate ores. (b) How is mercury extracted from its sulphide ore? Explain the various steps supported by chemical equations.	3
29	Draw a labelled diagram of open stomata. List two functions of stomata.	3
30	(a) Draw a diagram of a human female reproductive system and label the part (i) where fusion of egg and sperm takes place (ii) where the zygote is implanted (b) Briefly comment what happens when the human egg is not fertilised?	3
31	(a) Revanth claims to have obtained an image twice the size of object with a concave lens. Is he correct? Give reason for your answer. (b) Where should an object be placed in case of a convex lens to form an image of same size as of the object? Show with the help of ray diagram the position and the nature of the image formed.	3

32	<p>Draw a circuit diagram of an electric circuit containing a cell, a key, an ammeter, a resistor of <math>4\Omega</math> in series with a combination of two resistors (<math>8\Omega</math> each) in parallel and a voltmeter across parallel combination. Each of them dissipates maximum energy and can withstand a maximum power of <math>16W</math> without melting. Find the maximum current that can flow through the three resistors.</p>	3
33	<p>Magnetic field lines are shown in the given diagram. A student makes a statement that the magnetic field at 'A' is stronger than at 'B'. Justify this statement. Also redraw the diagram and mark the direction of magnetic field lines.</p> <div style="text-align: center;">  </div>	3
<p><b>SECTION - D</b></p> <p><b>Q.no. 34 to 36 are Long answer questions.</b></p>		
34	<p>(a) Define the term 'isomer'.</p> <p>(b) Two compounds have same molecular formula <math>C_3H_6O</math>. Write the name of these compounds and their structural formula.</p> <p>(c) How would you bring the following conversions:</p> <p style="padding-left: 40px;">(i) Ethanol to ethene</p> <p style="padding-left: 40px;">(ii) Ethanol to ethanoic acid</p> <p style="text-align: center;"><b>OR</b></p> <p>(a) State the reason why carbon can neither form <math>C^{4+}</math> cations nor <math>C^{4-}</math> anions, but forms covalent bonds. Also state reasons to explain why covalent compounds</p> <p style="padding-left: 40px;">(i) are bad conductors of electricity.</p> <p style="padding-left: 40px;">(ii) have low melting and boiling points.</p> <p>(b) Write the structural formula of benzene, <math>C_6H_6</math></p>	5
35	<p>a) Sometimes we come across people who are either very short (dwarfs) or extremely tall (giants). Explain how this happens? Name the hormone responsible for this disease and the organ producing the hormone.</p> <p>b) Name the hormone which stimulates the cells to grow longer and which help in the growth of the stem.</p> <p style="text-align: center;"><b>OR</b></p>	5

	<p>a)</p>  <p>(i) Name the parts labelled A and B in the neuron drawn above.  (ii) Which part acquires the information in the neuron?  (iii) Through which path does the information travel?  (iv) In what form does this information travel?  (v) Where is the impulse converted into chemical signal for onward transmission?</p> <p>(b) Name the hormone secreted by thyroid. What is its function? Why is the use of iodised salt advisable?</p>	
36	<p>A child while playing with his father's spectacles burnt a hole in a piece of paper by focusing a small image of the sun on it.</p> <p>(i) What defect of vision his father is suffering from?  (ii) Write two causes for this defect?  (iii) Draw a ray diagram to show image formation by the defective eye.  (iv) Draw a ray diagram showing corrected eye using proper lens.  (v) Compute the power of the lens of focal length – 2.5 m.</p> <p style="text-align: center;">OR</p> <p>(a) Explain the formation of rainbow in the sky with the help of a diagram. List the three phenomena of light involved.  (b) Give reasons:  (i) Red colour is selected for danger signals.  (ii) The sky appears dark in space.  (iii) The time difference between actual sunset and apparent sunset is about 2 minutes.</p>	5
<p><b>SECTION – E</b></p> <p><b>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.</b></p>		
37	<p>An organic compound P has the following structure.</p> 	4

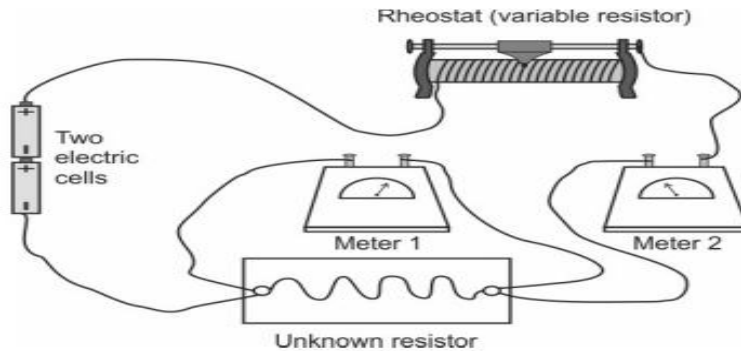


	<p>(a) To which homologous series does this compound belong? Define homologous series.</p> <p>(b) How will you convert the above compound to ethane? Write the chemical equation. Describe the type of flame that P produces on combustion.</p> <p style="text-align: center;"><b>OR</b></p> <p>(b) Draw the electron dot structure for the above compound P. Write the general formula used to represent compound P.</p>	
38	<p>Mendel was educated in a monastery where he started growing peas. Many others had studied the inheritance of traits in peas and other organisms earlier, but Mendel blended his knowledge of science and mathematics and was the first one to keep count of individuals exhibiting a particular trait in each generation. This helped him to arrive at the laws of inheritance.</p> <p>(a) Mention any two reasons why Mendel selected garden peas?</p> <p>(b) What is the transmission of traits (characters) from one generation to the next defined as?</p> <p>(c) The allele for tallness in pea plant is T. The allele for short pea plant is t. Draw a genetic diagram to show the genotype of the offspring in F<sub>2</sub> generation upon selfing between the offspring of F<sub>1</sub> generation.</p> <p style="text-align: center;"><b>OR</b></p> <p>(c) Define –</p> <p>(i) The law of segregation</p> <p>(ii) The law of dominance</p>	4

39

The diagram below shows how Amrutha had connected a circuit to verify Ohm's law

4



- (a) Identify which of the devices in the circuit is an ammeter. Justify your answer
- (b) State Ohm's law
- (c) Draw a circuit diagram with appropriate symbols for the circuit shown in the diagram above

**OR**

- (c) Amrutha forgot to put a switch in the circuit. During the experiment, the wire labelled "Unknown resistor" became hot. The resistivity of the material of the wire increases with temperature. Draw two potential difference vs current graphs (in the same diagram):
  - (i) as expected by Amrutha
  - (ii) as based on actual observation she would make