SET-A

CODE NO.-01/2024

G-W CLASSES, GONDIA

Near Giri Hospital, Vivekanand Colony, Gondia. Mob.: 9673916351, 9422950376
email : gwclassesgondia@gmail.com

PRE - BOARD-01 (2024)

CLASS-10 **SUBJECT–SCIENCE (086)**

TIME ALLOWED: 3 HRS. **MAX. MARKS :** 80

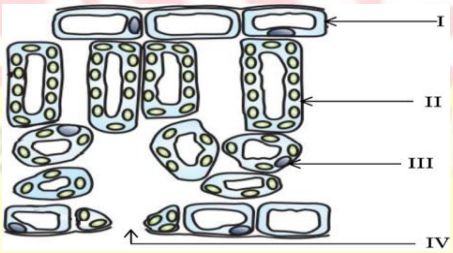
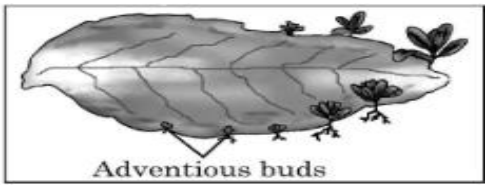
General Instructions:

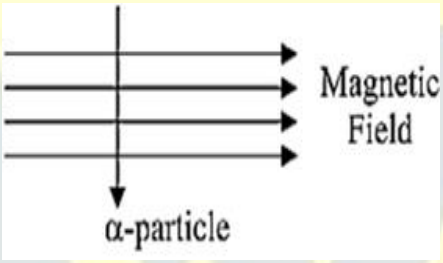
This question paper consists of 39 questions in 5 sections.

1. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
2. Section A consists of 20 objective - type questions carrying 1 mark each.
3. 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.
4. 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.
5. 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.
6. Section E consists of 3 source - based/case - based units of assessment of 04 marks each with sub - parts.

	Section A	
1	Study the following chemical reaction: $2Na(s) + 2H_2O(l) \rightarrow 2NaOH(aq) + H_2(g) \uparrow$ The reducing agent in this reaction is: a) Na b) H_2 c) H_2O d) NaOH	**[1]**
2	Find the incorrect statement : 1. Oxygen is highly combustible and hydrogen is a supporter of combustion, 2. Oxygen and hydrogen both are highly combustible, 3. Oxygen and hydrogen both are supporters of combustion, 4. Hydrogen is highly combustible and oxygen is a supporter of combustion a) A, B and C b) A, C and D c) A, B and D d) A, B and D	**[1]**
3	The salt present in tooth enamel is: a) Magnesium phosphate b) Aluminium phosphate c) Calcium phosphate d) Sodium phosphate	**[1]**

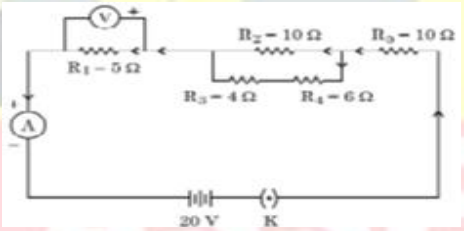
PTO

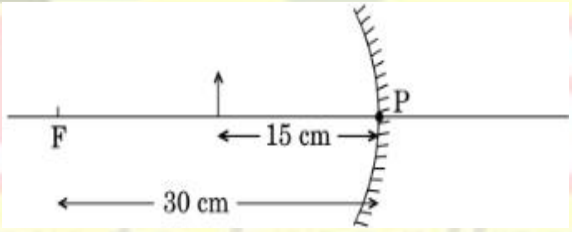
4	Few organic reactions are given below. Which of the reactions is not named correctly? a) $CH_3CH_2OH \xrightarrow{\text{acidified } K_2Cr_2O_7} \underset{\text{(Cumbustion)}}{CH_3COOH}$ b) $CH_3COOC_2H_5 \xrightarrow{NaOH} \underset{\text{(Saponification)}}{CH_3COONa + C_2H_5OH}$ c) $CH_3COOH + C_2H_5OH \xrightarrow{H^+} \underset{\text{(Esterification)}}{CH_3COOC_2H_5 + H_2O}$ d) $CH_3COONa + NaOH \rightarrow \underset{\text{(Decarboxylation)}}{CH_4 + Na_2CO_3}$	**[1]**
5	Bronze is an alloy of a) Copper, Tin and Zinc b) Copper and Zinc c) Aluminium and Tin d) Copper and Tin	**[1]**
6	A metal **X** is used in thermite process. When X is burnt in air it gives an amphoteric oxide **Y** . **X** and **Y** are respectively: a) Fe and Fe_3O_4 b) Al and Al_3O_4 c) Fe and Fe_2O_3 d) Al and Al_2O_3	**[1]**
7	IUPAC names of a few esters are given below: 1. Ethyl propanoate 2. Propyl methanoate 3. Methyl butanoate 4. Ethyl butanoate The ester(s) which contain(s) ten hydrogen atoms per molecule is/are a) (i) and (ii) only b) (iv) only c) (i) and (iii)only d) i only	**[1]**
8	In the following diagram, identify the cells through which massive amounts of gaseous exchange takes place for photosynthesis:  a) I b) III c) IV d) II	**[1]**
9	In an experiment with pea plants, a pure tall plant (TT) is crossed with a pure short plant (tt). The ratio of pure tall plant to pure short plants in F_2 generation will be a) 1 : 3 b) 3 : 1 c) 2 : 1 d) 1 : 1	**[1]**
10	In the given diagram the leaf shown belongs to which plant?  	**[1]**

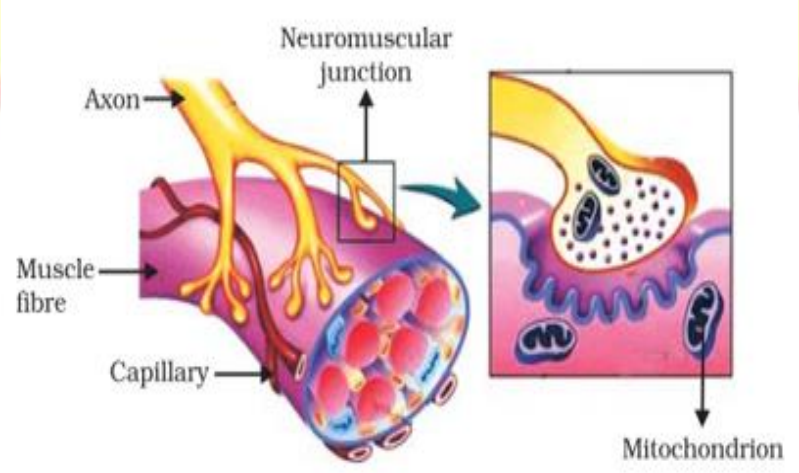
	a) Hibiscus b) Money plant c) Mustard d) Bryophyllum	
11	A zygote is formed by the fusion of a male gamete and a female gamete. The number of chromosomes in the zygote of a human is a) 46 b) 23 c) 92 d) 44	**[1]**
12	Consider the following statements about small intestine and select the one which is NOT correct: a) The villi of the small intestine absorb water from the unabsorbed food before it gets removed from the body via the anus. b) The small intestine is the site of complete digestion of food. c) The small intestine receives secretions from liver and pancreas. d) The length of the small intestine in animals differs as it depends on the type of food they eat.	**[1]**
13	An alpha particle enters a uniform magnetic field as shown. The direction of force experienced by the alpha particle is:  a) towards left b) out of the page c) towards right d) into the page	**[1]**
14	Two bulbs of 100 Wand 40 Ware connected in series. The current through the 100 Wbulb is 1 A. The current through the 40 Wbulb will be: a) 1 A b) 0.4 A c) 0.8 A d) 0.6 A	**[1]**
15	In an ecosystem, the10% of energy available for transfer from one trophic level to the next trophic level is in the form of **:** a) Mechanical energy. b) Light energy c) Chemical energy d) Heat energy	**[1]**
16	Which among the following are the artificial ecosystems? 1.Estuaries 2. Mountain 3.Crop field 4. Grassland 5. reefs 6. Park 7.Mangroves 8.Aquarium a) (iii), (vi) and (viii) only b) (ii), (iv) and (vi) only c) (ii), (vi) and (vii) only d) (i), (ii) and (v) only	**[1]**
17	**Assertion (A):** In the reaction, $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$, sodium chloride is precipitated. **Reason (R):** When an aqueous solution is added to another aqueous solution, an insoluble substance is formed, which is called precipitate. a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).	**[1]**

	b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A). c) Assertion (A) is true, but Reason (R) is false. d) Assertion (A) is false, but Reason (R) is true.	
18	**Assertion (A):** Scrotum is present outside the abdominal cavity. **Reason (R):** It stores sperms that require a lower temperature than the normal body temperature. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
19	**Assertion (A):** The strength of the magnetic field produced at the centre of a current - carrying circular coil increases on increasing the number of turns of the circular coil. **Reason (R):** Magnetic field strength is directly proportional to the number of turns of the circular coil. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
20	**Assertion (A):** The energy available to deer in a food chain is more as compared to that available to lion. **Reason (R):** Deer occupies second trophic level whereas lion occupies first trophic level in a food chain operating in grassland ecosystem. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
	SECTION B	
21	Write the structural formula and IUPAC name of the following: 1. A carboxylic acid with four C - atoms. 2. An alkyne with three C - atoms. 3. An alcohol having one C - atom.	**[2]**
22	What is placenta? Why is it extremely essential for the development of embryo?	**[2]**
23	Explain the statement, 'Bile does not contain any enzyme but it is essential for digestion.' **OR** Write any two ways by which plants obtain carbon dioxide. What causes the opening and closing of the stomata?	**[2]**
24	1. In refraction of light through a rectangular glass slab, the emergent ray is parallel to the direction of the incident ray. Why?	**[2]**

	2. What happens when a light ray is incident normally on one of the faces of a rectangular glass slab?	
25	How is ozone layer formed? State its importance to all life forms on earth? Why the amount of ozone in the atmosphere dropped sharply in the 1980s? **OR** What is meant by trophic level in a food chain? Construct a terrestrial food chain with four trophic levels. The energy flow in a food chain is always unidirectional. Why?	**[2]**
26	Give reasons: 1. Red colour is selected for danger signals. 2. The sky appears dark in space. 3. The time difference betweenactual sunset and apparent sunset is about 2 minutes.	**[2]**
	SECTION C	
27	P, Q and R are 3 elements which undergo chemical reactions according to the following equations: 1. $P_2O_3 + 2Q \rightarrow Q_2O_3 + 2P$ 2. $3RSO_4 + 2Q \rightarrow Q_2(SO_4)_3 + 3R$ 3. $3RO + 2P \rightarrow P_2O_3 + 3R$ Answer the following questions: a. Which element is most reactive? b. Which element is least reactive? c. State the type of reaction listed above.	**[3]**
28	A cleaned aluminium foil was placed in an aqueous solution of zinc sulphate. When the aluminium foil was taken out of the zinc sulphate solution after 15 minutes, its surface was found to be coated with a silvery grey deposit. From the given observation, what can be concluded? **OR** A, B and C are 3 elements which undergo chemical reactions according to following equations: a) $A_2O_3 + 2B \rightarrow B_2O_3 + 2A$ b) $3CSO_4 + 2B \rightarrow B_2(SO_4)_3 + 3C$ c) $3CO + 2A \rightarrow A_2SO_3 + 3C$ Answer of the following: i) Which element is most reactive? ii) Which element is least reactive?	**[3]**
29	During respiration in an organism A, one molecule of glucose produces 2 ATP	**[3]**

	molecules whereas in respiration of another organism B, one molecule of glucose produces 38 ATP molecules. 1. Which organism is undergoing aerobic respiration? 2. Which organism is undergoing anaerobic respiration? 3. Which type of organism A or B can convert glucose into alcohol? 4. Name one organism which behaves like A. 5. Name one organism which behaves like B.	
30	A green stemmed tomato plant denoted by (GG) is crossed with a tomato plant with purple stem denoted by (gg). 1. What colour of the stem would you expect in their F_1 progeny? 2. In what ratio would you find the green and purple coloured stem in plants of F_2 progeny? 3. What conclusion can be drawn for the above observations?	**[3]**
31	1. What should be the position of the object when a concave mirror is to be used a. as a shaving mirror and b. in torches producing parallel beam of light? 2. A man standing in front of a mirror, finds his image having a very small head and legs of normal size. What type of mirrors are used in designing such a mirror?	**[3]**
32	Study the following circuit and find:  1. Effective resistance of the circuit 2. Current drawn from the battery 3. Potential difference across the 5Ω resistor	**[3]**
33	1. Write the relationship between electrical resistance and electrical resistivity for a metallic conductor of cylindrical shape. Hence derive the SI unit of electrical resistivity. 2. Find the resistivity of the material of a metallic conductor of length 2 m and area of cross - section 1.4×10^{-6} m^2 . The resistance of the conductor is 0.04 ohm.	**[3]**
	SECTION D	
34	What are structural isomers? List any four characteristics of isomers. Draw the possible structures of butane. **OR**	**[5]**

	Consider the molecular formula of the carbon compounds (a) and (b) given below: (a) C_3H_8O (b) $C_3H_6O_2$ 1. Identify the functional groups in (a) and (b) and write their structures. 2. Are (a) and (b) isomers? Give reason. 3. What happens when alkaline KMnO4 is added, drop by drop, into a test tube containing warm propanol? Write the chemical equation for the reaction and state the role of alkaline $KMnO_4$ in this reaction.	
35	1. List the sequence of events in the uterus of a human female from fertilisation of egg till childbirth. 2. State the changes that are observed in the uterus if fertilisation of egg does not occur. **OR** 1. Name the disorder which a person is likely to suffer fromdue to the following: a. Over - secretion of growth hormone b. Deficiency of oestrogen in females c. Less secretion of thyroxine Also name the gland that secretes each of the hormones mentioned above. 2. How is the timing and amount of hormone released regulated? Explain with the help of an example.	**[5]**
36	1. Complete the following ray diagram:  2. Find the nature, position and size of the image formed. 3. Use mirror formula to determine the magnification in this case. **OR** 1. A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 30 cm. Find the position, nature and size of the image formed. 2. Draw a labelled ray diagram showing object distance, image distance and focal length in the above case.	**[5]**

	SECTION E	
37	**Read the following text carefully and answer the questions that follow:** Salts play a very important role in our daily life. Sodium chloride which is known as common salt is used almost in every kitchen. Baking soda is also a salt used in faster cooking as well as in baking industry. The family of salts is classified on the basis of cations and anions present in them. 1. Identify the acid and base from which Sodium chloride is formed. **(1)** 2. Find the cation and the anion present in Calcium sulphate. **(1)** 3. "Sodium chloride and washing soda both belong to the same family of salts." Justify this statement. **(2)** **OR** Define the term pH scale. Name the salt obtained by the reaction of Potassium hydroxide and Sulphuric acid and give the pH value of its aqueous solution. **(2)**	**[4]**
38	**Read the following text carefully and answer the questions that follow:** In animals, control and coordination are provided by nervous and muscular tissues. Touching a hot object is an urgent and dangerous situation for us. We need to detect it and respond to it. How do we detect that we are touching a hot object? All information from our environment is detected by the specialised tips of some nerve cells. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory receptors will detect the smell. This information, acquired at the end of the dendritic tip of a nerve cell sets off a chemical reaction that creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end. At the end of the axon, the electrical impulse sets off the release of some chemicals. These chemicals cross the gap, or synapse, and start a similar electrical impulse in the dendrite of the next neuron. This is a general scheme of how nervous impulses travel in the body. A similar synapse finally allows the delivery of such impulses from neurons to other cells, such as muscles cells or glands.  	**[4]**

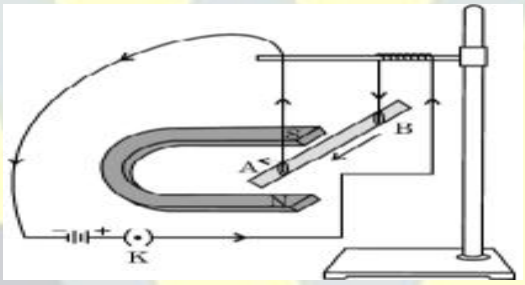
1. Why does the flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron take place but not in the reverse direction? (1)
2. From where the electrical impulse travels? (1)
3. Name the chemical which released at the end of axon to transmit the signal to the other neuron. (2)

OR

What happens at the synapse between 2neurons? (2)

39 **Read the following text carefully and answer the questions that follow:** **[4]**

A student was asked to perform an experiment to study the force on a current carrying conductor in a magnetic field. He took a small aluminum rod AB, a strong horse shoe magnet, some connecting wires, a battery and a switch and connected them as shown. He observed that on passing current, the rod gets displaced. On reversing the direction of current, the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon, answer the following questions :



1. State the condition under which the displacement of the rod is largest for the same magnitude of current flowing through it. (1)
2. State the rule that determines the direction of the force on the conductor AB. (1)
3.

If the U shaped magnet is held vertically and the aluminum rod is suspended horizontally with its end B towards due north, then on passing current through the rod from B to A as shown, in which direction will the rod be displaced?

   a. Name any two devices that use current carrying conductors and magnetic field. (2)

4. Draw the pattern of magnetic field lines produced around a current - carrying straight conductor held vertically on horizontal cardboard. Indicate the direction of the field lines as well as the direction of the current flowing through the conductor. (2)