Delhi Public School, Howrah

PERIODIC ASSESSMENT II (2024-2025)

Class-X

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

Subject:- Science (Code No. 086)

Time:-3 Hours **F.M.-80**

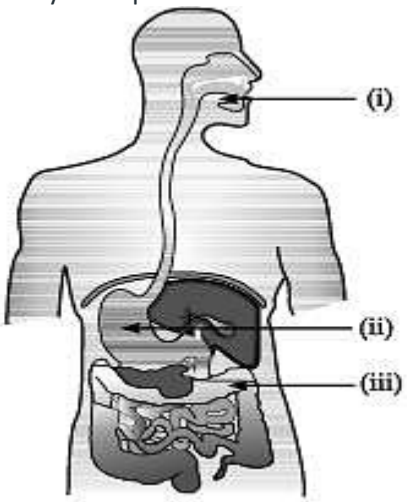
General Instructions:

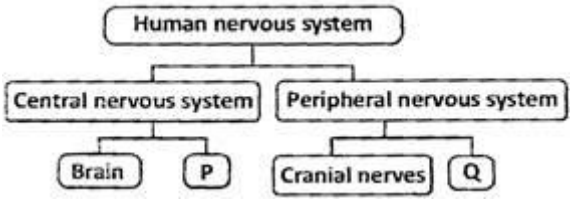
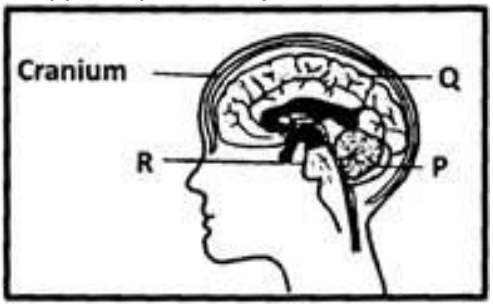
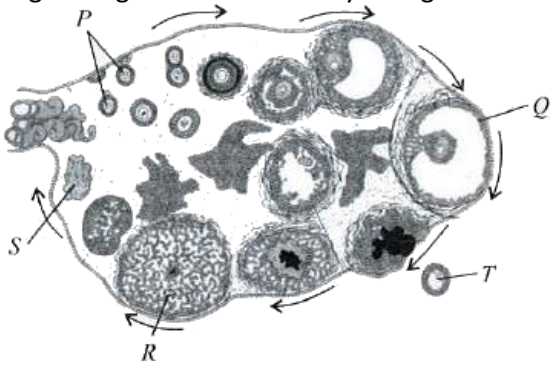
i. **This question paper consists of 39 questions in 5 sections.**
ii. **All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.**
iii. **Section A consists of 20 objective type questions carrying 01 mark each.**
iv. **Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should 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 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.**

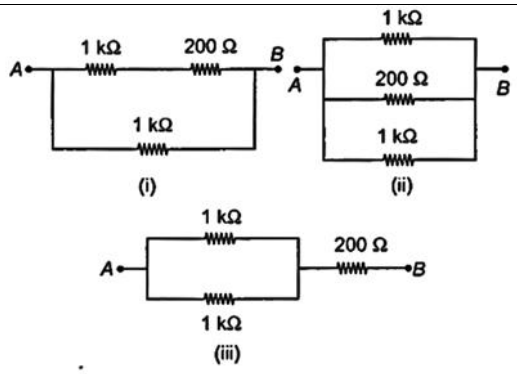
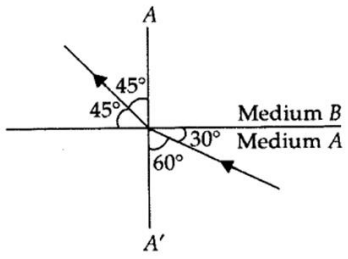
SECTION A

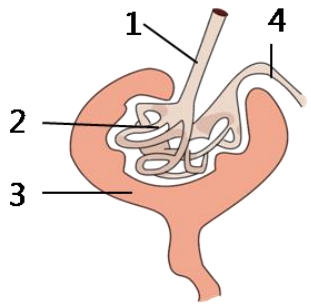
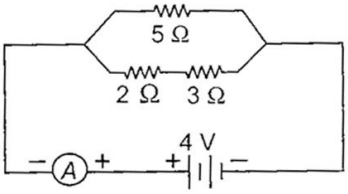
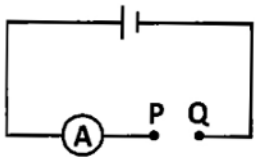
Select and write one most appropriate option out of the four options given for each of the questions 1 – 20. There is no negative mark for incorrect response.

Q. No.	Questions	Marks
1.	The pH of three solutions X, Y and Z is 6, 4 and 8 respectively. Which of the following is the correct order of acidic strength? (a) X > Y > Z (b) Z > Y > X (c) Y > X > Z (d) Z > X > Y	**1**
2.	Which of the following is the correct arrangement of the given metals in ascending order of their reactivity? Zinc, Iron, Magnesium, Sodium (a) Zinc > Iron > Magnesium > Sodium (b) Sodium > Magnesium > Iron > Zinc (c) Sodium > Zinc > Magnesium > Iron (d) Sodium > Magnesium > Zinc > Iron	**1**
3.	Non-metals form covalent chlorides because (a) they can give electrons to chlorine (b) they can share electrons with chlorine (c) they can give electrons to chlorine atoms to form chloride ions	**1**

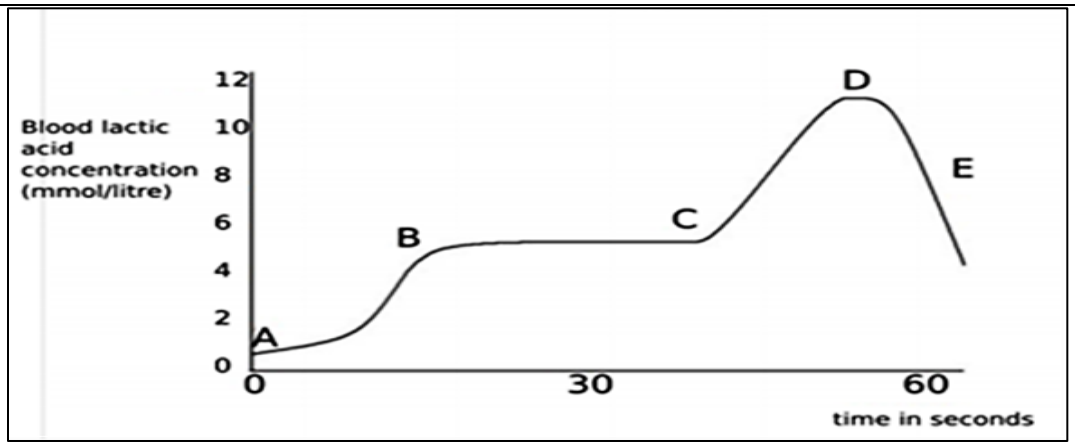
	(d) they cannot share electrons with chlorine atoms	
4.	Chemically rust is: (a) Hydrated ferrous oxide (b) Hydrated ferric oxide (c) Only ferric oxide (d) Hydrated iron	**1**
5.	In the reaction: $PbO + C \rightarrow Pb + CO$ (a) PbO is oxidized (b) C acts as an oxidising agent (c) Carbon acts as a reduction agent (d) Reaction does not represent redox reaction.	**1**
6.	Which of the following is not a balanced equation? (a) $Fe + Cl_2 \rightarrow FeCl_3$ (b) $Mg + CuSO_4 \rightarrow MgSO_4 + Cu$ (c) $NaOH + HCl \rightarrow NaCl + H_2O$ (d) $Zn + S \rightarrow ZnS$	**1**
7.	How is the hydrogen ion concentration and pH related to each other? (a) They are inversely proportional. (b) They are directly proportional. (c) They are equal. (d) They have no relation.	**1**
8.	If a thermometer is kept in a conical flask containing germinating seeds, the temperature of thermometer will a. increase b. decrease c. remain the same d. first increases then decrease.	**1**
9.	Identify the option that indicates the correct enzyme that is secreted in location A, B and C.  a. (i)-lipase, (ii)-trypsin, (iii)-pepsin b. (i)-amylase, (ii)-pepsin, (iii)-trypsin c. (i)-trypsin, (ii)-amylase, (iii)-carboxylase d. (i)-permease, (ii)-carboxylase, (iii)-oxidase	**1**
10.	The chart given below shows the human nervous system. Identify P and Q.	**1**

	 a. P- Cranial nerves Q- Spinal nerves b. P- Neurons Q- Spinal cord c. P- Spinal nerves Q- Cranial nerves d. P- Spinal cord Q- Spinal nerves	
11.	What will happen if part P is injured?  a. Breathing will be affected. b. The person will not be able to think rationally. c. Coordination and stability of the body will be adversely affected. d. The person will not be able to move.	**1**
12.	The given figure shows monthly changes in the human ovary during the reproductive cycle.  Which of the following statements is correct regarding the labelled structures? a. Before puberty, only structure T undergoes meiosis. b. The hormone produced by structure R stimulates the pituitary gland to secrete luteinising hormone. c. The hormone produced by structure S is responsible for the development of female secondary sex characters. d. The hormone produced by P and Q stimulates the proliferation of the endometrial lining of the uterine wall.	**1**
13.	In which of the following network of resistors the equivalent resistance between points A and B is highest?	**1**

	a. Network (i) b. Network (ii) c. Network (iii) d. All have equal equivalent resistance. 	
14.	The even figure shows a ray of light as it travels from medium A to medium B. Refractive index of the medium B relative to medium A is a. $\frac{\sqrt{3}}{\sqrt{2}}$ b. $\frac{\sqrt{2}}{\sqrt{3}}$ c. $\frac{1}{\sqrt{2}}$ d. $\sqrt{2}$ 	**1**
15.	Which of the following means social forestry? a. Growing different types of plantations together b. Growing one type of trees on the land c. Management of forests by village bodies d. Management of forests by Govt.	**1**
16.	If an H is for tall trait which is dominant and h is the recessive trait for short, which of the following cross will result in 1:1 tall: short progeny? a. HH X hh b. Hh X Hh c. Hh X hh d. hh X hh	**1**
	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**	
17.	Assertion (A): The aqueous solution of glucose and alcohol do not show acidic character. Reason (R): Aqueous solution of glucose and alcohol do not give H^+ ions.	**1**
18.	Assertion (A): Recycling of waste material can help in maintaining ecological balance. Reason (R): Non-biodegradable waste poses serious disposal problems.	**1**
19.	Assertion(A): A receptor is a specialized group of cells in a sense organ that perceive a particular type of stimulus. Reason (R): Different sense organs have different receptors for detecting stimuli.	**1**
20.	Assertion (A): A rainbow is sometimes seen in the sky in rainy season only when observer's back is towards the Sun. Reason (R): Internal reflection in the water droplets cause dispersion and the final rays are in backward direction.	**1**
	SECTION B **Q. no. 21 to 26 are very short answer questions.**	
21.	Fresh milk has pH of 6. When it changes to curd, will its pH value increase or decrease? Why?	**2**

22.	Study the diagram given below and then answer the question that follow:  a. Name the part labelled 1 and 2. b. What is the technical term given to the process occurring in 2 and 3? c. Name the region in the kidney where the above structure is present.	**2**
23.	In the context of reproduction of species state the main difference between fission and fragmentation. Also give one example of each. **OR** State one genetically different feature between sperms and eggs of humans. What is its consequence?	**2**
24.	Absolute refractive Index of some of material is tabulated below. **Material** | **Rock salt** | **Kerosene** | **Water** | **Diamond** **Refractive** | **1.54** | **1.44** | **1.33** | **2.42** a. In which of these does light travel fastest and why? b. Arrange these materials in ascending order of their optical densities.	**2**
25.	Observe the given circuit diagram and answer the following questions.  a. What is the value of current shown by the ammeter? b. What is the potential difference across 2 ohm resistor? **OR** In an experiment, four resistance wires made from the same material are connected in between the terminals P and Q in the circuit as shown below.  The length and diameter of the wires are different as given below. | | Length | Diameter | | (a) | 0.5m | 0.5mm | | (b) | 0.5m | 0.05 mm | | (c) | 5.0 m | 0.5 mm | | (d) | 5,0m | 0.05m | Which wire will give the smallest reading on the ammeter and why?	**2**

26.	 a. Identify the social and economical movement that has been shown in the above picture for the purpose of conservation of natural resources. How did it help in the process of conservation? Explain. b. List two problems that may arise by planting trees of single variety over vast tracts of a forest.	**2**
	SECTION C **Q.no. 27 to 33 are short answer questions.**	
27.	(a) Name the element which shows non-metallic properties but is also present in the activity series of metals. (b) Name any one metal which reacts neither with cold water nor with hot water, but reacts with heated steam to produce hydrogen gas. (c) Name the chemical process used to prevent corrosion of iron.	**3**
28.	A metal E is stored under kerosene. When a small piece of it is left open in air, it catches fire. When the product formed is dissolved in water, it turns red litmus to blue. (a) Name the metal E. (b) Write the chemical equation for the reaction when it is exposed to air and when the product is dissolved in water. (c) Explain the process by which the metal E is obtained from its molten chloride. OR A student has been collecting silver coins and copper coins. One day, she observed a black coating on silver coins and a green coating on copper coins. (a) Which chemical phenomenon is responsible for these coatings? (b) Write the chemical name & formula of the black and green coatings.	**3**
29.	a. A cheetah, on seeing a prey, moves towards him at a very high speed. What causes the movement of his muscles? How does the chemistry of cellular components of muscles change during this event? b. Sameer was studying in his room. Suddenly he smelt something is burning and sees smoke in his room. He rushes out of his room immediately. Was Sameer's action voluntary or involuntary? why?	**3**
30.	The athlete's blood lactic acid concentration is depicted in the graph below during a 400-meter race, with point D showing the peak. Complete the following table about each section of the race.	**3**



Complete the following table about the given each section of the race:

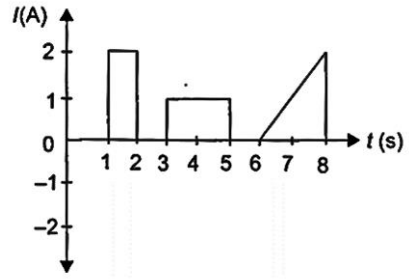
a. Describe the strategy of the runner.
b. Provide evidence from the graph by describing the change in lactic acid concentration.
c. Explain what is causing the change in lactic acid concentration.

***Note: D to E (After the race is finished)**

(Copy the following table in the answer sheet and write the answer)

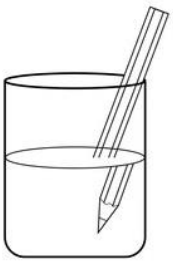
Section of race	a. Strategy	b. Evidence	c. Explanation
A to B			
B to C			
C to D			

31. a. The plot represents the flow of current through a wire at three different time intervals. **3**



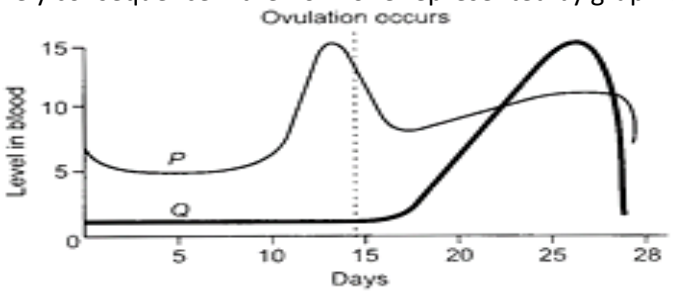
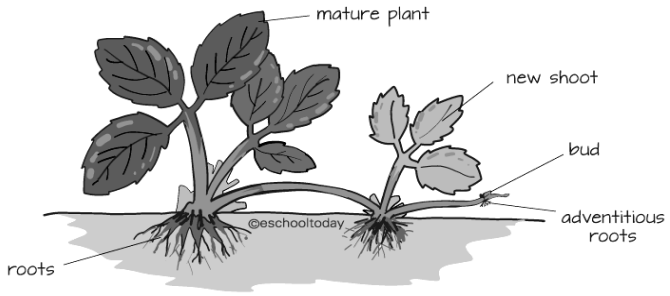
Find the ratio of charges flowing through the wire at the three different intervals of time.
b. What is electrical resistivity of a material? What is its unit?
c. Two wires of same metal have the same length but their cross-sectional area in the ratio 3:1. They are joined in series. The resistance of the thicker wire is 10Ω. Calculate the total resistance of the combination.

32. a. A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. **3**

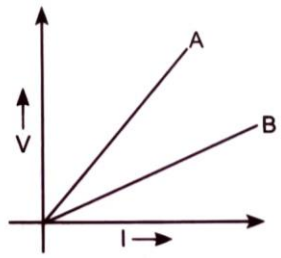


Will the pencil appear to be bent to the same extent, if instead of water we use liquids like, kerosene or turpentine. Support your answer with reason.
b. Write laws of refraction.
c. Explain the laws of refraction with the help of a ray diagram, when a ray of light passes through a rectangular glass slab.

33. Nitish is sitting at the back of the classroom and he cannot read clearly the letters written on the blackboard. **3**
a. What kind of eye defect is he suffering from?

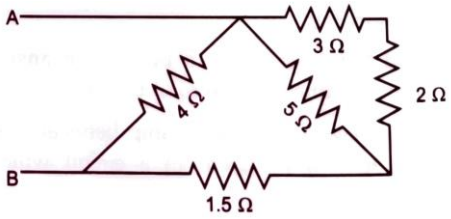
	b. Draw a ray diagram to explain the defect and the correction of this defect. c. Being a doctor what advice will you give him?	
	SECTION-D **Q.no. 34 to 36 are long answer questions.**	
34.	A student took 2-3 g of an element X in a glass beaker & poured water over it slowly. He observed bubbles along with hissing noise. The beaker becomes quite hot. (a) Identify X. Is it a metal or non-metal? Justify. (b) What type of reaction is it? Explain. (c) Write the relevant reaction. OR (a) How is Magnesium Chloride formed by the transfer of electrons? Show with Lewis dot structure. (b) Why does the solution of Magnesium chloride conduct electricity but not the solid Magnesium chloride? (c) How will you show experimentally that metals are good conductors of heat?	**5**
35.	a. Draw a well labelled diagram of female reproductive system of human. b. The given graph shows the hormonal changes during a normal menstrual cycle. What would be a likely consequence if the hormone represented by graph Q is lacking in an adult female?  c. Blueprints of body design are stored in DNA. Why? **OR** a. Draw the diagram of male reproductive system of human.  b. In the above picture, the shoot of the parent plant is pushed below the soil that results in growth of a new plant. What is the advantage of this process? c. How does the amount of DNA remain constant through each new generation in a combination of DNA copies of two individuals?	**3+2**
36.	a. Explain the refraction of light through a triangular glass prism using a labelled ray diagram. Hence define the angle of deviation. b. 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+2+1**

	c. The near point of a hypermetropic eye is 1 m. What is the power of the lens required to correct this defect? Assume that the near point of the normal eye is 25 cm. **OR** a. A person needs a lens of power – 4.5 D for correction of her vision. i. What kind of defect in vision is she suffering from? ii. What is the focal length of the corrective lens? iii. What is the nature of the corrective lens? b. The image of a candle flame formed by a lens is obtained on a screen placed on the other side of the lens. If the image is three times the size of the flame and the distance between lens and image is 80 cm, at what distance should the candle be placed from the lens? What is the nature of the image at a distance of 80 cm and the lens?	**3+2**
	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.	Taj mahal, the seventh wonder of the world, is made of white stone. This white stone contains the same substance 'A' that is present in chalk powder and lime-stone. It is turning yellow due to polluted air. If it is cleaned by an acidic cleaner, a gas 'B' is released, which when passed through a solution 'C', forms the same substance which is present in the white stone that was used to make Taj mahal. (a) Identify C. (b) What is the nature of the aqueous solution of A? (c) Write the reaction involved in production of B from A if HCl is present as the pollutant. OR (c) Write the reaction involved in production of A from C.	**4**
38.	Pooja has green eyes while her parents and brother have black eyes. Pooja's husband Ravi has black eyes while his mother has green eyes and father has black eyes. a. On the basis of the above given information, is the green eye colour a dominant or recessive trait? Justify your answer. b. What is the possible genetic makeup of Pooja's brother's eye colour? c. What is the probability that the offspring of Pooja and Ravi will have green eyes? Also, show the inheritance of eye colour in the offspring with the help of a suitable cross. **OR** c. 50% of the offspring of Pooja's brother are green eyed. With help of cross show how this is possible.	**1+1+2**
39.	In a circuit, several resistors may be combined to form a network. The combination must have two endpoints to connect it with a battery or other elements of the circuit. When the resistors are connected in series then the current flowing in each remains the same but potential differences across each resistor will vary. When the resistances are connected in parallel, the potential difference across each resistor will be the same though a different amount of current will flow in each resistor. a. The equivalent resistance of two resistors x and y is Z when connected in series and M when connected in parallel. Find the ration of Z and M. b. Two wires each having a resistance value equal to R are first connected in series and then connected in parallel. The plots shows the graphical representation of resistances in both cases.	**1+1+2**



Which one among them shows series combination and which one shows parallel combination?

c. Find the equivalent resistance of the given network between A and B.



OR

c. What is the equivalent resistance between points A and B in the given circuit diagram?