Delhi Public School, Howrah

PERIODIC ASSESSMENT III (2025-2026)

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 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.**

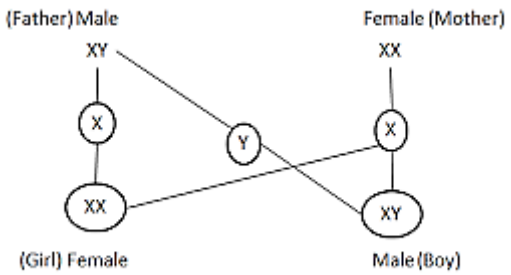
ii. **All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.**

SECTION – A

1. A student places one leaf of a plant in sunlight and covers the other leaf with black paper. After some time, only the exposed leaf tests positive for starch. This experiment demonstrates— **1**

A. Water is necessary for photosynthesis.
B. CO_2 is necessary for photosynthesis.
C. Light is necessary for photosynthesis.
D. Chlorophyll is necessary for photosynthesis.

2. Given below is a visual representation of how sex is determined in human beings. Based on the diagram, which statement is **correct**? **1**



A. Mother determines the sex of the child.
B. Father determines the sex of the child because he contributes either X or Y chromosome.
C. Both parents equally determine the sex of the child.
D. Sex is determined randomly without involvement of chromosomes.

3. A person accidentally inhales a little smoke from a burning stove. He starts coughing immediately. What does this coughing indicate? **1**

A. Lungs are storing extra air.
B. Alveoli are increasing the surface area.
C. Trachea is trying to clear the irritants.
D. Diaphragm has stopped moving.

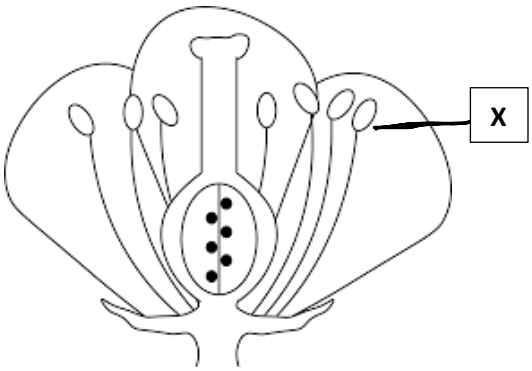
4. A farmer wants only round-seeded offspring. Which parental combination should he select? **1**

A. RR × rr
B. Rr × rr
C. Rr × Rr
D. Rr × RR

5. A grassland ecosystem receives 10,000 J of solar energy. Plants convert 1% of this energy into food. According to the 10% law, how much energy will the primary carnivore receive? **1**

A. 1 J B. 10 J C.100 J D.1000 J

6. In the given diagram, structure X contains pollen grains. If 'X' is removed from a flower, what will be the immediate effect? **1**



A. The ovary will not develop.
B. Pollination cannot occur.
C. Self-pollination becomes easier.
D. Fruit will form without seed

7. Students add dry leaves**,** fruit peels, leftover food and some soil to a compost pit. What is the role of the soil here? **1**

A. To increase temperature.
B. To speed up growth of decomposers.
C. To prevent bad smell.
D. To kill bacteria.

The following two questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by 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, 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.

8. **Assertion (A):** Plant stems grow upward even when kept in the dark for a few days. **1**
Reason. (R): Gibberellins promote cell elongation in stems.

9. **Assertion (A):** Traits acquired during a lifetime can be inherited by the offspring. **1**
Reason (R): Acquired traits bring changes in the DNA of the germ cells.

10. A. A lake gets contaminated with a pesticide. Why are fish-eating birds like eagles more affected than the fish themselves? **2**

B. A student claims that if we keep adding more producers to an ecosystem, all trophic levels will automatically increase. Justify this statement with a proper explanation.

11. ***Students to attempt either option A or B.*** **2**

A. I. If asexual reproduction creates identical offspring, why do some plants that reproduce vegetatively (e.g., sugarcane) show differences in height, leaf size, or yield?
II. Placenta is considered a two-way channel between the mother and the developing embryo. Explain the reason.

OR

B. I. A gardener wants a rose plant with exactly the same flower colour and fragrance as the parent plant. Which method should he use, and why?
II. Why are testes located outside the male body in a scrotum?

12. A homozygous dominant guinea pig with black fur is crossed with a homozygous guinea pig with white fur. The F_1 generation is crossed with itself. What percentage of F_2 generation is expected to show white fur? **2**

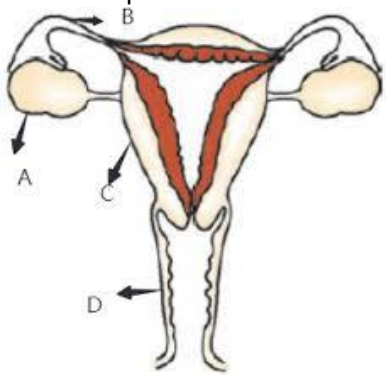
13. Give reason for the following statements. **3**

A. A mountaineer climbing a high mountain breathes rapidly and feels dizzy.

B. A person eats heavy fried food and later experiences indigestion.

C. A cut in an artery causes more serious bleeding than a cut in a vein.

14. Study the diagram given below and answer the questions that follows. **3**



A. Identify the parts labelled as A, B, C and D.

B. If part B of a woman is blocked, how would this affect reproduction? Suggest one medical intervention.

C. Explain why fertilization cannot occur in part D.

15. **Read the following case and answer the following questions:** **4**

Meera keeps several potted plants at home. She notices that the leaves of one plant are turning yellow and wilted. A gardening expert tells her that the plant's stomata are blocked due to dust accumulation, affecting its removal of metabolic waste and gaseous exchange.

A. How can blocked stomata affect the excretion process in plants?

B. Give two processes of excretion seen in plants other than the ones mentioned in the above passage.

Attempt either subpart C or D.

C. How does transpiration help in the upward movement of water in plants?

OR

D. How is the wilting of leaf related to excretion?

16. ***Attempt either option A or B.*** **2+3**

A. I. In the diagram of a neuron, a student labels the axon incorrectly as the dendrite. How will this mistake affect the explanation of impulse transmission?

II. A person's hand shakes when trying to lift a cup of tea. Which part of the brain may be affected? Give reason.

III. Diagrammatically explain the neuromuscular junction.

OR

B. I. A diabetic patient, after taking insulin feels dizzy and weak. Explain what might have happened to his blood glucose level and how the pancreas normally maintains glucose balance.

II. A student observes that a *Mimosa* (touch-me-not) plant folds its leaves when touched. Explain the mechanism of this movement and why it is not considered a tropic movement.

III. Draw a diagram of a human brain labelling the parts responsible for salivation and remembering.

SECTION – B

17. Which of the following statements is(are) true when HCl (g) is passed through water? [1]

i. It does not ionise in the solution as it is a covalent compound.

ii. It ionises in the solution.

iii. It gives both hydrogen and hydroxyl ions in the solution.

iv. It forms hydronium ions in the solution due to the combination of hydrogen ions with water molecules.

A. (iii) only B. (iii) and (iv)

C. (i) only D. (ii) and (iv)

18. Read the statements given below and choose the correct option. [1]

Statement A: Detergents form micelles but soaps do not.

Statement B: Soaps are mostly biodegradable.

A. Both the statements A and B are true.

B. Neither statement A nor statement B is true.

C. Statement B is true; Statement A is false.

D. Statement A is true; Statement B is false.

19. Copper utensils slowly lose their shiny brown surface and gain a green coat on prolonged exposure to atmospheric air. This is due to the formation of a coating of [1]

A. basic copper sulphate.

B. basic cupric oxide.

C. basic cuprous oxide.

D. basic copper carbonate.

20. Match the following and choose the correct option. [1]

Column A	**Column B**
(i) Copper is used in electrical appliances	(a) As it reacts with hydrogen sulphide.
(ii) Potassium is very reactive	(b) As it is a good conductor of electricity.
(iii) Silver is tarnished	(c) As it is non-metal and a good conductor of electricity
(iv) Graphite is considered special	(d) hence it is stored in kerosene.

A. (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)

B. (i) - (d), (ii) - (a), (iii) - (c), (iv) - (b)

C. (i) - (c), (ii) - (b), (iii) - (d), (iv) - (a)

D. (i) - (a), (ii) - (c), (iii) - (b), (iv) - (d)

21. The colour of the solution observed after 30 minutes of placing zinc metal in copper sulphate solution is

A. blue.

B. colourless.

C. dirty green.

D. reddish brown.

22. Which one of the following properties of carbon is not responsible for its formation of a large number of compounds? [1]

A. Isomerism B. Catenation C. Tetravalency D. Allotropy

23. On placing a copper coin in a test tube containing green ferrous sulphate solution, it is observed that the ferrous sulphate solution [1]

A. turns blue, and a grey substance is deposited on the copper coin.

B. turns colourless and a grey substance is deposited on the copper coin.

C. turns colourless and a reddish–brown substance is deposited on the copper coin.

D. remains green with no change in the copper coin.

24. Assertion (A): Concentration of the acid or base decreases on addition of more solvent. [1]

Reason (R): Solvent brings the particles of acids or bases closer.

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.

25. A clear solution of slaked lime is made by dissolving $Ca(OH)_2$ in an excess of water. This solution is left exposed to air. The solution slowly turns milky as a faint white precipitate forms. Explain why this faint white precipitate forms and support your response with the help of a chemical equation. [2]

26. *Attempt either option A or B.*

A. A pH paper changes its colour depending on the pH value of the substance it is dipped in. The table shows the pH values corresponding to the colour of the pH paper after it is dipped separately in the four liquids. [2+1]

Sample no.	Values
Liquid 1	9
Liquid 2	12
Liquid 3	5
Liquid 4	3

I. Which liquid has the lowest concentration of hydrogen ions? How do you interpret that?

II. What is the possible colour of the pH paper when dipped in liquid no. 3?

OR

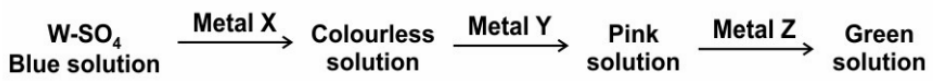
B. A student tests three unknown solutions P, Q and R using litmus solutions and records the observation as shown in the table given below.

Solution	Blue Litmus	Red Litmus
P	Turns red	No change
Q	No change	Turns blue
R	No change	No change

I. Identify the nature of P, Q and R.

II. Explain why R does not affect either litmus.

27. The blue-coloured solution of the sulphate salt of metal W is taken in a beaker. Metal powders X, Y and Z are added one after another to the beaker. The colour changes occurring in the solution are shown below. [2+1]



A. State what colour change, if any, will occur if metal X is added again to the green solution in the beaker, Explain why.

B. Write the name of the reduction process used to reduce W from its oxide.

28. Read the following text carefully and answer the questions that follow.

In a balanced chemical reaction, equal number of atoms are present on both sides of reaction. A balanced chemical reaction follows the law of conservation of mass, which states that total mass of reactants and products participating in a reaction must be equal. For example, a balanced chemical equation of burning of magnesium in oxygen to form magnesium oxide is written as,

$$2Mg + O_2 \rightarrow 2MgO$$

The mass of reactants ($2 \times 24 + 32 = 80$) is equal to the mass of products [$2 \times (24 + 16) = 80$].

A. If a student finds that the number of oxygen atoms on the product side is more than on the reactant side in an equation, which of the following options should the student conclude? [1]

i. Law of conservation of mass is followed ii. The equation is balanced

iii. The equation is not balanced iv. More reactants are needed

Attempt either option B or C.

B. The solid mercury (II) oxide is heated, and liquid mercury and oxygen gas are produced. Write the balanced chemical reaction. Identify the reducing & oxidizing agent in this reaction. [2]

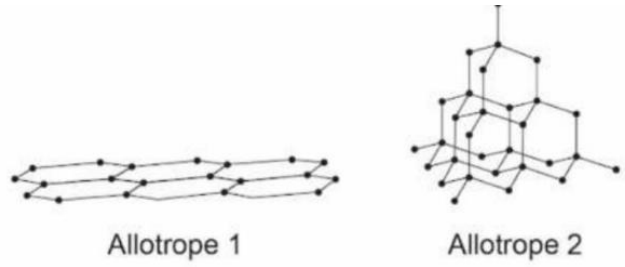
OR

C. In the given chemical reaction, $2C_6H_6(l) + 15O_2(g) \rightarrow mCO_2(g) + nH_2O(l)$ [2]
Find the values of m and n respectively. Also name the type of the reaction.

D. If the number of hydrogen atoms doubles on the reactant side after adding a coefficient, what should the student do next to maintain balance? Choose the correct option. [1]
i. Remove hydrogen from products
ii. Adjust the coefficient on the product side
iii. Change the chemical formula of the product
iv. Ignore the change

29. ***Attempt either option A or B.***

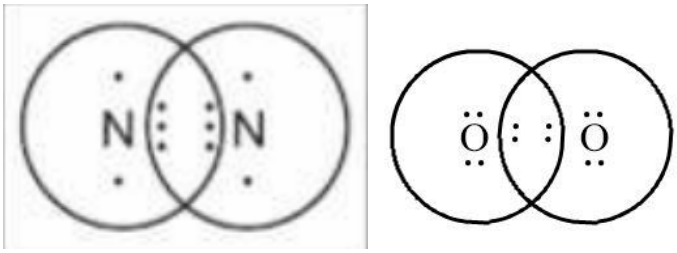
A. I. i. Why does carbon form compounds generally by covalent bonding? [2+2+1]
ii. Why do these compounds have low melting and boiling points?
II. The pictures given below shows the bonds between atoms in two allotropes of carbon. Which allotrope is harder? Explain your answer.



III. Draw electron dot structure of ethanol.

OR

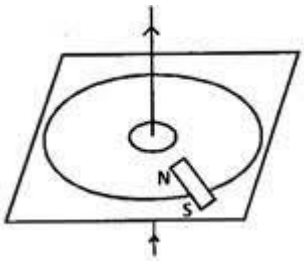
B. I. The pictures show the bonds formed by the sharing of electrons by the atoms of two different molecules. Explain with reason. [2+2+1]



II. With the help of balanced chemical equations, explain what happens when
i. A piece of sodium is added to ethanol.
ii. Ethanol burns in the presence of oxygen.
III. Write the chemical equation of saponification reaction using suitable condition.

SECTION - C

30. A light bar magnet is suspended near a current-carrying wire as shown alongside. What will happen to the light bar magnet? **1**



(a) It will rotate anti-clockwise.
(b) It will rotate clockwise.
(c) It will move to the left.
(d) It will move to the right.

31. A voltmeter measures the potential difference in any electrical circuit. Identify the CORRECT statement from the statements given below. **1**

(a) A voltmeter is a high-resistance instrument and is connected in series in a circuit.
(b) A voltmeter is a low-resistance instrument and is connected in series in a circuit.
(c) A voltmeter is a high-resistance instrument and is connected in parallel in a circuit.
(d) A voltmeter is a low-resistance instrument and is connected in parallel in a circuit.

The following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by 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 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.

32. **Assertion(A):** The product of resistivity and conductivity of a conductor depends on the material of the conductor. **1**

Reason(R): Each of resistivity and conductivity depends on the material of the conductor.

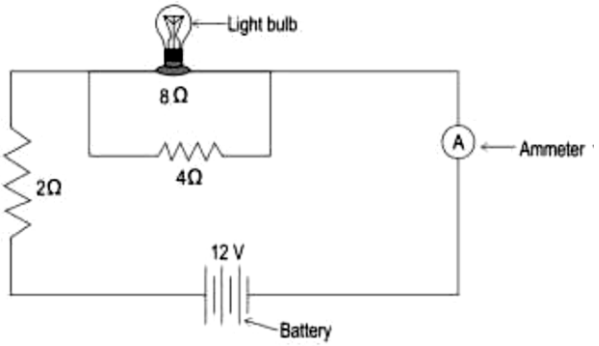
33. Analyse the following observation table showing variation of image-distance (v) with object-distance (u) in case of a convex lens and answer the following questions: **2**

S.No.	Object distance u (cm)	Image distance v (cm)
1	- 90	+ 18
2	- 60	+ 20
3	- 30	+ 30
4	- 20	+ 60
5	- 18	+ 90
6	- 10	+ 100

(a) What is the focal length of the convex lens? Give reason to support your answer.
(b) Write the serial number of the incorrect observation. How did you arrive at this conclusion?

34. ***Students to attempt either option A or B.*** **2**

A. Shreya wants to measure the current flowing through the circuit as shown below.



2

Which of the four ammeters shown below can she use for this purpose? Show your calculations.

Ammeter	Minimum range	Maximum range
P	0 mA	1 m A
Q	0 mA	10 mA
R	0 A	1 A
S	0 A	10 A

OR

B. (i) An electric geyser rated at 1500 W, 250 V is connected to a 250 V mains line. Find the electric current drawn by it.
(ii) Is a 5A fuse safe for the working of the geyser mentioned above? Justify your answer.

35. A. Absolute refractive indices of two media P and Q are 1.33 (n_P) and 2.52 (n_Q) respectively. The speed of light in medium P is 2 x 10^8 m/s. (i) What would be the speed of light in medium Q? (ii) If the angle of incidence for a ray of light travelling from medium P to Q is 0°, then what will be the path of light in the medium Q? **3**

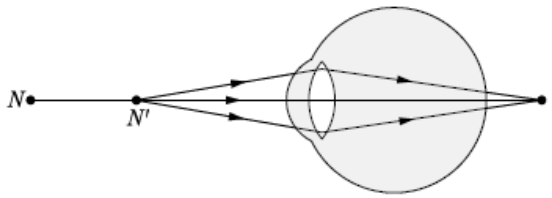
B. Why does a ray of light bend when it passes through a different medium?

36. A. It is established that an electric current through a metallic conductor produces a magnetic field around it. Is there a similar magnetic field produced around a thin beam of moving (i) alpha particles, (ii) neutrons? Justify your answer. **3**

B. Sonia draws magnetic field lines close to the axis of a current carrying circular loop. As she moves away from the centre of the circular loop, she observes that the lines keep on diverging. How will you explain her observation?

C. Why is it that if a current-carrying coil has n turns, the field produced at any point is n times as large as that produced by a single turn?

37. Study the diagram given below and answer the following questions. N is the near point for normal eye and N' is the near point for defected eye. **3**

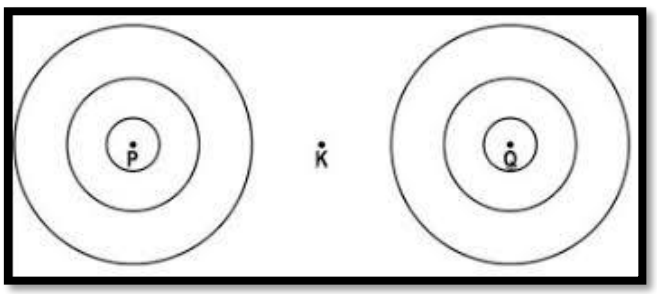


A. Name the defect of vision depicted in the diagram.

B. List two causes of the above defect.

C. Draw a ray diagram for the correction of the above defect using an appropriate lens.

38. P and Q represent two straight wires carrying equal current (I) in a direction perpendicular to the plane of the screen outwards as shown in the figure. K is the midpoint of the line joining P and Q. The image shows the magnetic field lines around the wire when the currents are flowing out of the screen. But the directions of the magnetic field are not marked. **4**



A. Draw the image in the figure and mark the directions of the magnetic field.

B. If the current in the wires is increased, how will the strength of the magnetic field around P and Q change? Draw the magnetic field lines around P and Q to represent this change.

Students to attempt either option C or D.

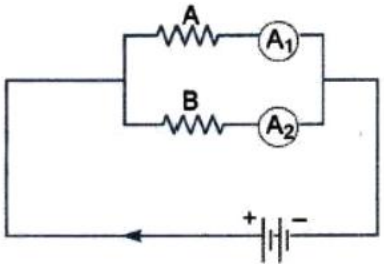
C. If B is the magnetic field at point K due to the current in wire P, what will be the magnetic field due to P and Q at the midpoint K? Give a reason for your answer.

OR

D. If B is the magnetic field at point K due to the current in wire P and the current in wire Q is reversed, what will be the magnetic field at midpoint K? Give a reason for your answer.

39. ***Students to attempt either option A or B.*** 5

A. Ayan was investigating a circuit for his school project. He wanted to demonstrate the effect of length on the resistance of a conductor. The following is the given circuit with resistors A and B that are made of the same material and the same thickness but 'A' is twice as long as 'B'. The total current in the circuit is 6 A and the Voltage of the battery is 12 V. **(1+1+2+1)**



(a) What will be the resistance in the circuit?

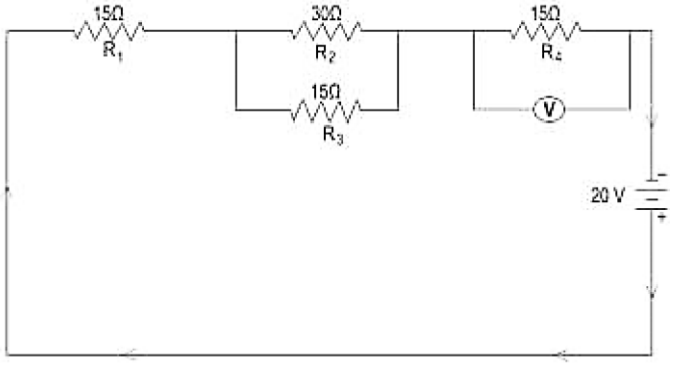
(b) Determine the value of 'R_A' and 'R_B'.

(c) Determine the current in both the ammeters. Will the current in 'A_1 'and 'A_2' be the same? Justify your answer with proper calculation.

(d) What are the factors that affect the resistivity of a conductor?

OR

B. Four resistors, a voltmeter and a battery are connected in a circuit as shown below. **(1+2+1+1)**



(a) What is the net resistance in the circuit?

(b) How much potential difference will the voltmeter connected across the resistor R_4 measure?

(c) What is the power dissipated by the resistor R_1?

(d) If R_3 is removed, will the net current in the circuit increase or decrease or remain the same? Justify your answer.