G-W CLASSES, GONDIA

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SUBJECT: SCIENCE **MAX. MARKS: 80**
CLASS : X **DURATION: 3 HRS**

General Instruction:

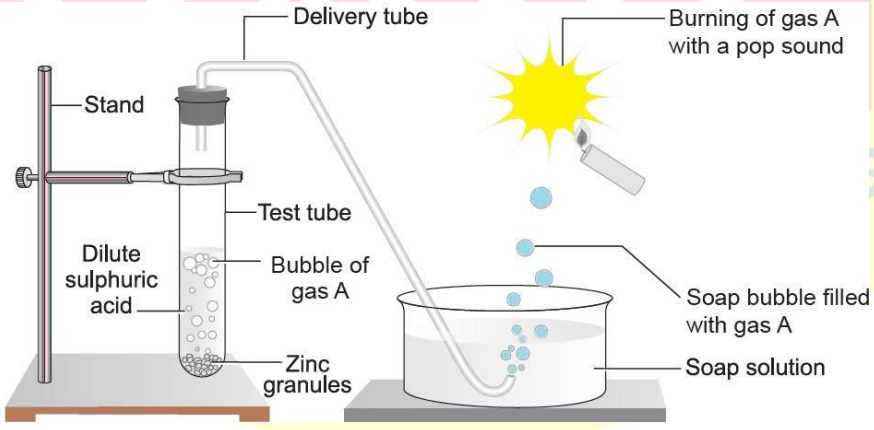
1. This Question Paper has 5 Sections A-E.
2. **Section A** has 20 MCQs carrying 1 mark each.
3. **Section B** has 6 questions carrying 02 marks each.
4. **Section C** has 7 questions carrying 03 marks each.
5. **Section D** has 3 questions carrying 05 marks each.
6. **Section E** has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

SECTION – A

Questions 1 to 20 carry 1 mark each.

1. While studying the saponification reaction, what do you observe when you mix an equal amount of colourless vegetable oil and 20% aqueous solution of NaOH in a beaker?
(a) The colour of the mixture has become dark brown.
(b) A brisk effervescence is taking place in the beaker.
(c) The outer surface of the beaker has become hot.
(d) The outer surface of the beaker has become cold.

2. Identify gas A in the following experiment.



(a) Nitrogen (b) Hydrogen (c) Oxygen (d) Carbon dioxide

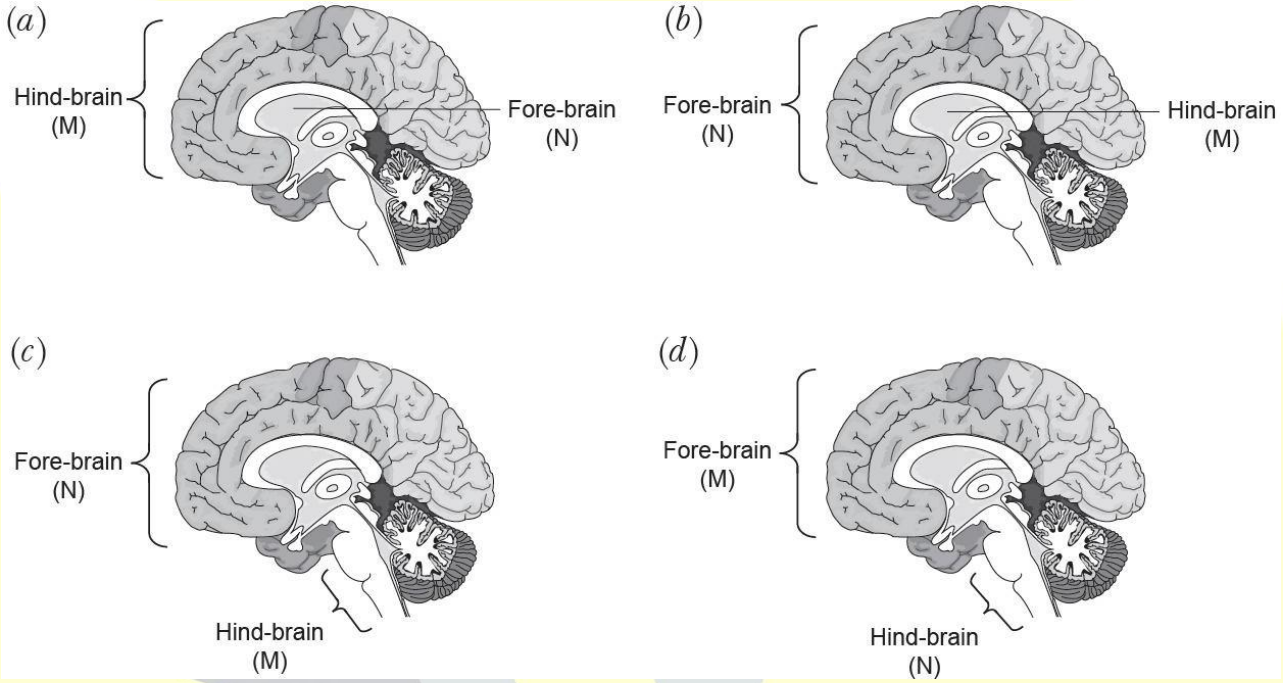
3. Why do we store silver chloride in dark-coloured bottles?
(a) To prevent precipitation of silver chloride
(b) To prevent decomposition of silver chloride
(c) To promote decomposition of silver chloride
(d) All of these

4. Which of the following will turn phenolphthalein pink?

(a) NaOH(aq) (b) HCl(aq) (c) CH3COOH(aq) (d) H2O

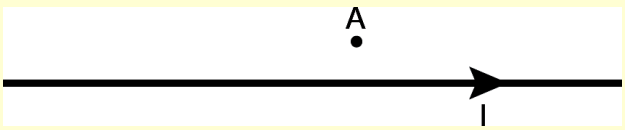
5. When sodium hydrogen carbonate is added to ethanoic acid, a gas is evolved. Consider the following statements about the gas evolved.
(i) It turns lime water milky.
(ii) It is evolved with a brisk effervescence.
(iii) It has a smell of burning sulphur.
(iv) It is also a by-product of respiration.
The correct statements are:
(a) (i) and (ii) only (b) (i) and (iv) only (c) (i), (iii) and (iv) (d) (i), (ii) and (iv)

6. Which option illustrates the location of centre that controls the feelings associated with hunger (M) and the centre that allows a person to walk in a straight line (N)?



7. Identify X, Y and Z based on the basis of given information. X is a non-metal, which is an important constituent of our food. It forms two oxides Y and Z. Y is toxic and it causes suffocation and sometimes death. Z is responsible for global warming.
(a) X= C, Y= CO, Z=CO_2 (b) X = S, Y= SO_2, Z= SO_3
(c) X=P, Y=P_2O_3, Z=P_2O_3 (d) X= O, Y = O_2, Z = O_3

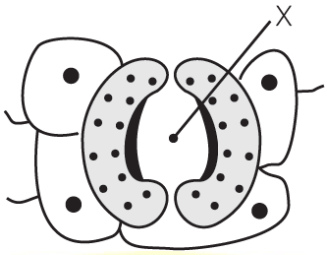
8. What is the direction of magnetic field at a point A above the wire carrying current I as



shown in figure?
(a) Out of the page (b) Into the page (c) Up the page (d) Down the page

9. Choose the correct statement about heart.
(a) The upper two chambers of human heart are called ventricles.
(b) The lower two chambers of human heart are called atrium.
(c) The chambers of the heart are separated by a partition called pericardium.
(d) The pulmonary artery carries deoxygenated blood from the right ventricle to the lungs.

10. If the structure marked X in the diagram given below is blocked, then which of the processes will not occur?



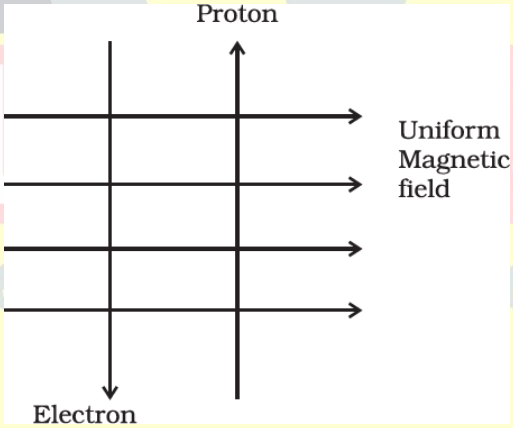
(a) Transpiration and respiration
(b) Transpiration, photosynthesis and respiration
(c) Respiration, transpiration and transportation
(d) Respiration and photosynthesis

11. In peas, a pure tall plant (TT) is crossed with a short plant (tt). The ratio of pure tall plants to short plants in F_2 is
(a) 1 : 3 (b) 3 : 1 (c) 1 : 1 (d) 2 : 1

12. A cylindrical conductor of length *l* and uniform area of cross section A has resistance R. Another conductor of length 2*l* and resistance R of the same material has area of crosssection:
(a) A/2 (b) 3A/2 (c) 2A (d) 3A

13. As per Michael Faraday, the forefinger, middle finger and thumb indicate the direction of:
(a) magnetic field, force and current respectively.
(b) magnetic field, current and force respectively.
(c) current, force and magnetic field respectively.
(d) force, magnetic field and current respectively.

14. A uniform magnetic field exists in the plane of paper pointing from left to right as shown in below Figure. In the field an electron and a proton move as shown. The electron and the



proton experience
(a) forces both pointing into the plane of paper
(b) forces both pointing out of the plane of paper
(c) forces pointing into the plane of paper and out of the plane of paper, respectively
(d) force pointing opposite and along the direction of the uniform magnetic field respectively

15. The hetero atoms present in $CH_3—CH_2—O—CH_2—CH_2—Cl$ are
(i) Oxygen (ii) Carbon (iii) Hydrogen (iv) Chlorine
(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

16. In humans, the life processes are controlled and regulated by:
(a) reproductive and endocrine system (b) respiratory and nervous system

(c) endocrine and digestive system (d) nervous and endocrine system

DIRECTION: In the question number 17 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**.
Choose the correct option
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

17. Assertion (A): Hydrogen gas is not evolved when a metal reacts with nitric acid.
Reason (R): Nitric acid is a strong oxidising agent.

18. Assertion (A): Lipase help in emulsification of fats.
Reason (R): Lipase hydrolyses fats and oils.

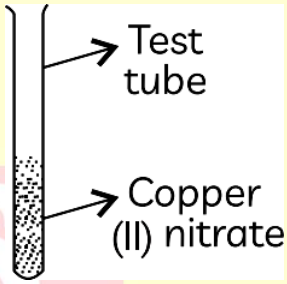
19. Assertion: Strength of an electromagnet can be increased by increasing the number of turns per unit length in solenoid coil.
Reason: Strength of an electromagnet can be increased by increasing the current flowing through the solenoid.

20. Assertion(A): Spores are formed in sporangia.
Reason(R): Spores grow into separate individuals in moist conditions.

SECTION – B

Questions 21 to 26 carry 2 marks each.

21. Observe the given figure: What happens when the tube is heated?
(a) Write a balanced chemical equation of the reaction.
(b) Identify the brown gas X evolved.



22. Define an ecosystem. Draw a block diagram to show the flow of energy in an ecosystem.

23. What will happen if mucus is not secreted by the gastric glands?

24. Why does carbon become stable after sharing four electrons? What type of bond is formed by sharing?

OR

Why are covalent compounds being poor conductors of electricity? Why do covalent compounds have low melting and boiling points?

25. A student sitting at the back of the classroom cannot read clearly the letters written on the blackboard. What advice will a doctor give to her? Draw ray diagram for the correction of this defect.

OR

Why do we see a rainbow in the sky only after rainfall?

26. Give two examples of decomposers. State their important role in nature.

SECTION – C

Questions 27 to 33 carry 3 marks each.

27. Can two people with brown eyes have a blue-eyed baby? Explain.

28. A chemical compound 'X' is used in the soap and glass industry. It is prepared from brine.
(i) Write the chemical name, common name and chemical formula of 'X'.
(ii) Write the equation involved in its preparation.
(iii) What happens when it is treated with water containing Ca or Mg salts?

29. A piece of wire having resistance 'R' is cut into four equal parts.
(a) How does the resistance of each part compare with the original resistance?
(b) If the four parts are placed in parallel, how will be the resistance of the combination compare with the resistance of the original wire?

30. An object 6 cm in size is placed at 50 cm in front of a convex lens of focal length 30 cm. At what distance from the lens should a screen be placed in order to obtain a sharp image of the

object? Find the nature and size of the image. Also draw labelled ray diagram to show the image formation in this case.

31. (i) What is an electromagnet? List any two uses.
(ii) Draw a labelled diagram to show how an electromagnet is made.

OR

With the help of a labelled diagram, explain the distribution of magnetic field due to a current through a circular loop. 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?
(ii) Draw a pattern of magnetic field formed around a current carrying solenoid. What happens to the magnetic field when the current through the solenoid is reversed?

32. (a) How does food chain differ from a food web?
(b) Make food chains in (i) forest (ii) pond.

33. How is copper extracted from its sulphide ore ? Explain the various steps supported by chemical equations. Draw labelled diagram for the electrolytic refining of copper.

OR

Write the balanced chemical equations for the following reactions and identify the type of reaction in each case.
(i) Thermit reaction, iron (III) oxide reacts with aluminium and gives molten iron and aluminium oxide.
(ii) Magnesium ribbon is burnt in an atmosphere of nitrogen gas to form solid magnesium nitride.
(iii) Chlorine gas is passed in an aqueous potassium iodide solution to form potassium chloride solution and solid iodine.
(iv) Ethanol is burnt in air to form carbon dioxide, water and releases heat.

SECTION – D

Questions 34 to 36 carry 5 marks each.

34. What are esters? How are esters prepared? Write the chemical equation for the reaction involved. What happens when an ester reacts with sodium hydroxide? Write the chemical equation for the reaction and also state the name and use of this reaction.

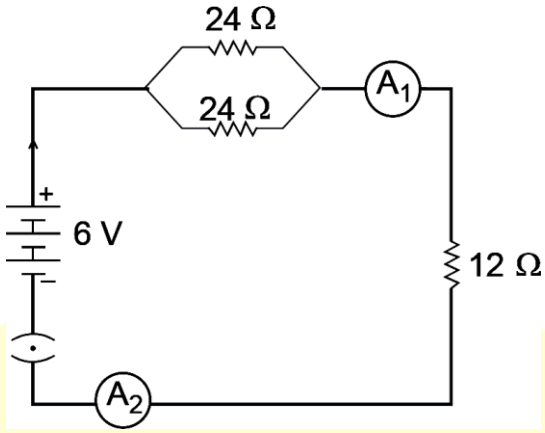
OR

What is the difference between soaps and detergents? State in brief the cleansing action of soaps in removing an oily spot from a fabric. Why are soaps not very effective when a fabric is washed in hard water? How is this problem resolved?

35. (i) How will you infer with the help of an experiment that the same current flows through every part of the circuit containing three resistors R_1, R_2 and R_3 in series connected to a battery of V

volts?

(ii) Study the following circuit and find out:



(a) Current in 12 Ω resistor.

(b) Difference in the readings of A_1 and A_2, if any.

36. What is sexual reproduction? Explain how this mode of reproduction gives rise to more viable variations than asexual reproduction. How does this affect the evolution?

OR

(a) What are dominant and recessive traits?

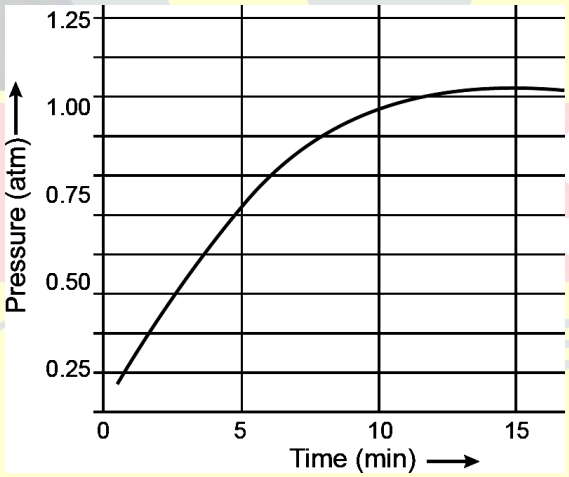
(b) "Is it possible that a trait is inherited but may not be expressed in the next generation?" Give a suitable example to justify this statement.

SECTION – E(Case Study Based Questions)

Questions 37 to 39 carry 4 marks each.

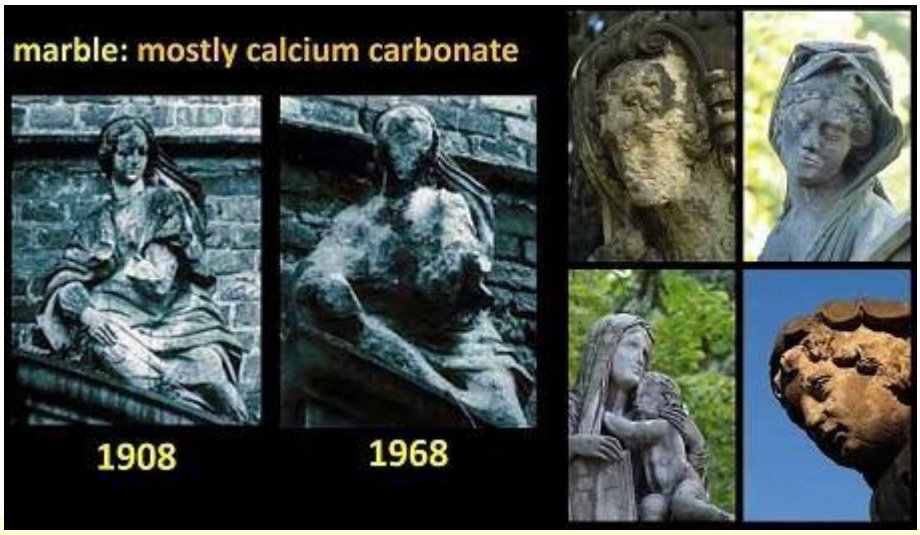
37. Case Study – 1

A student added 10 g of calcium carbonate in a rigid container, secured it tightly and started to heat it. After some time, an increase in pressure was observed, the pressure reading was then noted at intervals of 5 mins and plotted against time, in a graph as shown below.



(i) During which interval did maximum decomposition took place?

(ii) Marble statues are corroded or stained when they repeatedly come into contact with polluted rain water. Identify the main reason.



(iii) What happens when calcium carbonate decompose? What could be done to increase the rate of decomposition of $CaCO_3$?

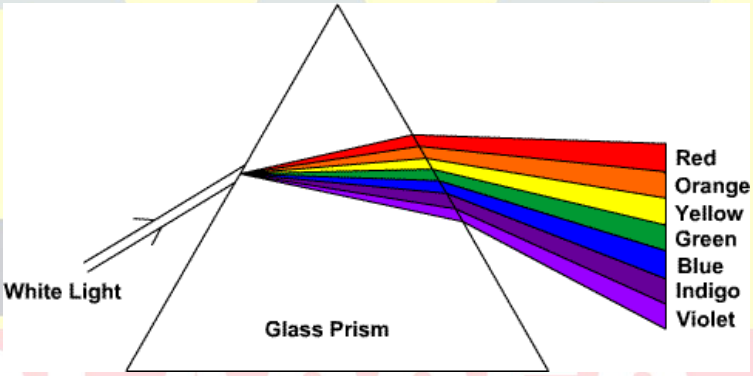
OR

(iii) Is decomposition of limestone endothermic? Give reason.

38. Case Study - 2

Dispersion of light occurs when white light is separated into its different constituent colors because of refraction and Snell's law.

From Snell's law it can be seen that the angle of refraction of light in a prism depends on the refractive index of the prism material.



Color	l(nm)	Freq. (Hz)
Red	760–647	4.3×10^{14}
Orange	647-585	4.3×10^{14}
Yellow	585-575	5.2×10^{14}
Green	575-491	5.6×10^{14}
Blue	491-424	6.6×10^{14}

Since the refractive index varies with wavelength, the angle that the light is refracted by will also vary with wavelength, causing an angular separation of the colors known as angular dispersion.

For visible light, refraction indices n of most transparent materials (e.g., air, glasses) decrease with increasing wavelength l:

Colour	Wavelength (nm)	Crown glass	Flint glass
Violet	396.9	1.533	1.663
Blue	486.1	1.523	1.639
Yellow	589.3	1.517	1.627
Red	656.3	1.515	1.622

Most often seen in recently made puddles on the sides of roads, the oil refracts light much the

same way a rainbow does. Simply put, the thin layer of oil floating on top of the water refracts the light which then bounces back up off the water underneath, splitting the light rays creating a pool of rainbow colours.

(a) Which ray is least deviated by a prism?

(b) Which colour of light which has the minimum velocity in the glass prism?

(c) Which optical phenomenon is involved in formation of rainbow?

OR

(c) What is the angle of deviation (d) of a prism?

39. Case Study – 3

Sahil performed an experiment to study the inheritance pattern of genes. He crossed tall pea plants (TT) with short pea plants (tt) and obtained all tall plants in F_1 generation.

(i) What will be set of genes present in the F_1 generation?

(ii) Give reason why only tall plants are observed in F_1 progeny.

(iii) When F_1 plants were self-pollinated, a total of 800 plants were produced. How many of these would be tall, medium height or short plants? Give the genotype of F_2 generation.

OR

(iii) When F_1 plants were cross - pollinated with plants having tt genes, a total of 800 plants were produced. How many of these would be tall, medium height or short plants? Give the genotype of F_2 generation.

"Don't worry about failure; you only have to be right once."