



G-W CLASSES, GONDIA

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SAMPLE PAPER TEST- 02

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 5 questions carrying 02 marks each.
 4. **Section C** has 6 questions carrying 03 marks each.
 5. **Section D** has 4 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
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8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION – A

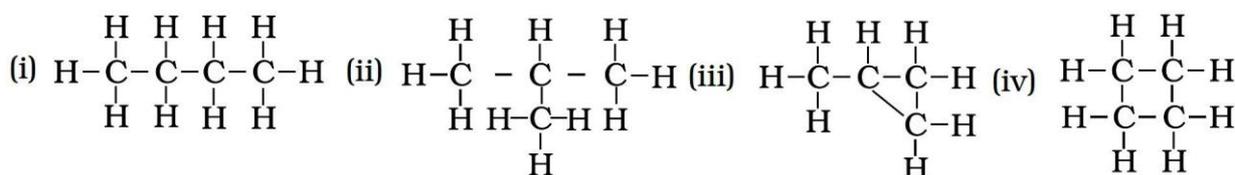
Questions 1 to 20 carry 1 mark each.

1. A scientist in a chemistry lab wants to make salt of pH 5.5 using acid and base. The table shows the acid and base present in the lab.

1	HCl
2	NaOH
3	H ₂ CO ₃
4	NH ₄ OH
5	CH ₃ COOH

Which of the acid and base he should use for the reaction?

- (a) CH₃COOH and NaOH (b) HCl and NaOH (c) HCl and NH₄OH (d) H₂CO₃ and NaOH
2. Which of the following are correct structural isomers of butane?



- (a) (i) and (iii) (b) (ii) and (iv) (c) (i) and (ii) (d) (iii) and (iv)

3. Biomagnification refers to the increase in the :

- (a) body weight of an organism.
- (b) growth of phytoplanktons.
- (c) the amount of harmful chemicals in the successive trophic levels of a food chain.
- (d) number of plants and animals in an area.

4. When aqueous solutions of barium chloride and sodium sulphate react together, an insoluble substance along with aqueous solution of sodium chloride is formed. This reaction is an example of a :

- (a) combination reaction (b) decomposition reaction
- (c) displacement reaction (d) double displacement reaction

5. A doctor advised a person to take an injection of insulin because :

- (a) his heart was beating slowly.
- (b) his blood pressure was low.
- (c) he was looking short in height.
- (d) his pancreas was not secreting the required hormone in proper amounts.

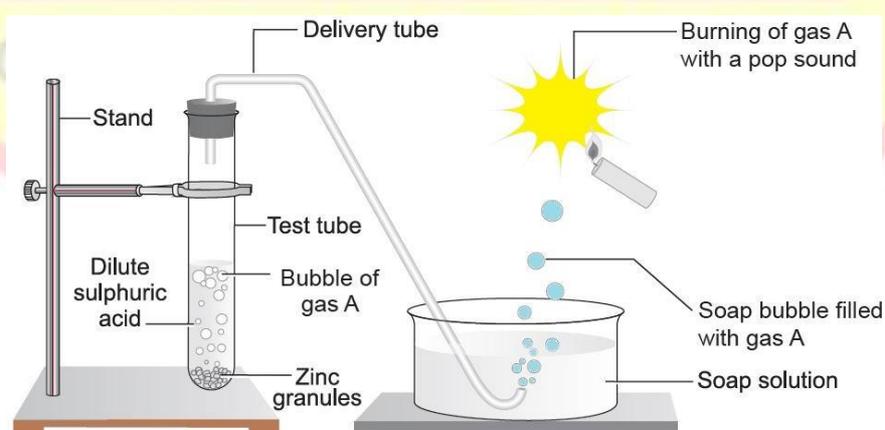
6. The movement of sunflowers is in response to a stimulus such as :

- (a) gravity (b) chemicals (c) day or night (d) water

7. The acid present in nettle sting is :

- (a) Acetic acid (b) Methanoic acid (c) Tartaric acid (d) Citric acid

8. Study the diagram given alongside and identify the gas formed in the reaction.



- (a) Carbon dioxide which extinguishes the burning candle.
 - (b) Oxygen due to which the candle burns more brightly.
 - (c) Sulphur dioxide which produces a suffocating smell.
 - (d) Hydrogen which while burning produces a popping sound.
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9. Electrical impulse travels in a neuron from
- Dendrite → axon → axonal end → cell body
 - Cell body → dendrite → axon → axonal end
 - Dendrite → cell body → axon → axonal end
 - Axonal end → axon → cell body → dendrite

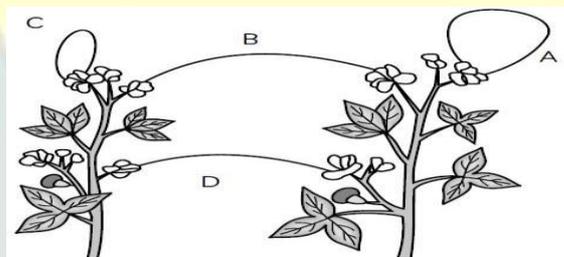
10. In plants, waste products like resins and gums are stored in :

- leaves that fall off
- old xylem
- phloem
- cellular vacuoles

11. When a 4V battery is connected across an unknown resistor there is a current of 100 mA in the circuit. The value of the resistance of the resistor is:

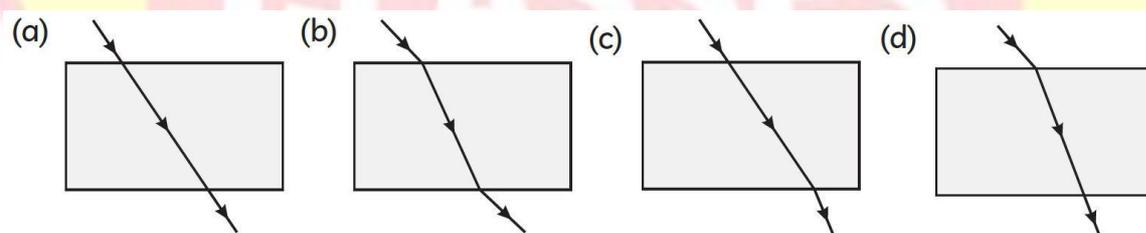
- 4 Ω
- 40 Ω
- 400 Ω
- 0.4 Ω

12. The diagram shown below depicts pollination. Choose the options that will show a maximum variation in the offspring.



- A, B and C
- B and D
- B, C and D
- A and C

13. The path of a ray of light coming from air passing through a rectangular glass slab is traced by four students shown as A, B, C and D in the figure. Which one of them is correct?

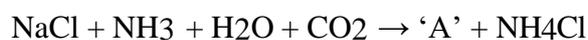


14. In the given food chain, suppose the amount of energy at the fourth trophic level is 5 kJ, what will be the energy available at the producer level?

Grass → Grasshopper → Frog → Snake → Hawk

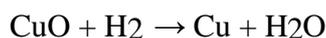
- 5 kJ
- 50 kJ
- 500 kJ
- 5000 kJ

15. The name of the compound 'A' formed in the following reaction is :



- Sodium carbonate
- Ammonium carbonate
- Sodium hydrogen carbonate
- Ammonium hydrogen carbonate

16. Select the correct statement from the following about the reaction :



- (a) CuO is getting oxidised and H₂ is getting reduced.
- (b) H₂ is getting oxidised and CuO is getting reduced.
- (c) CuO is a reducing agent.
- (d) H₂ is an oxidising agent.

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) :** The energy of charged particle moving in a uniform magnetic field does not change.

Reason (R) : Work done by magnetic field on the charge is zero.

18. **Assertion (A):** Ozone (O₃) is a molecule formed by the three atoms of oxygen.

Reason (R): Ozone shields the surface of the Earth from ultraviolet (UV) radiation from the Sun.

19. **Assertion (A):** Soaps do not form lather (foam) with hard water.

Reason (R): Hard water has calcium and magnesium salts dissolved in it which on reacting with soap form scum.

20. **Assertion (A):** Chemical co-ordination is seen in both plants and animals.

Reason (R): Plant hormones control directional growth, whereas in animals, growth is never seen in one direction only.

SECTION – B

Questions 21 to 25 carry 2 marks each.

21. Define the terms ductility and malleability. Name an element which exhibits both of these properties giving justification for your answer. 'Variations are beneficial to the species but not necessarily for the individual'. Justify.

22. Draw a labelled ray diagram to show the formation of image due to a concave mirror when an object is placed between its pole and principal focus.

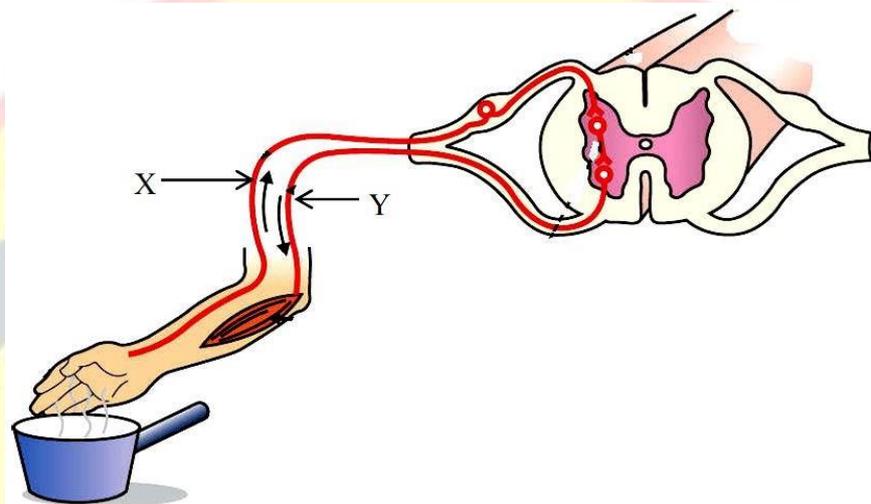
23. (a) Draw a ray diagram to explain the term angle of deviation.

OR

(b) Name the muscles present in the human eye which enable it to focus on objects at varied distances (i.e., distant as well as nearby objects). Explain how it happens.

24. “A vegetarian food habit helps in getting more energy.” Justify the statement.

25. (a) In the diagram given below, name the labelled parts X and Y. Mention one function for each.



OR

(b) Name the parts of the nervous system which are involved in the following activities :

- (i) Maintaining body posture
- (ii) Salivation
- (iii) Hunger
- (iv) Answering a question

SECTION – C

Questions 27 to 33 carry 3 marks each.

26. An element A burns with golden flame in air. It reacts with another element B, atomic number 17 to give a product C. An aqueous solution of product C on electrolysis gives a compound D and liberates hydrogen. Identify A, B, C and D. Also write down the equations for the reactions involved.

27. (a) Identify the acid and the base from which sodium chloride is obtained. Which type of salt is it? When is it called rock salt? How is rock salt formed?

OR

(b) (i) Identify the acid and the base from which the following salts are obtained :

(I) Sodium chloride

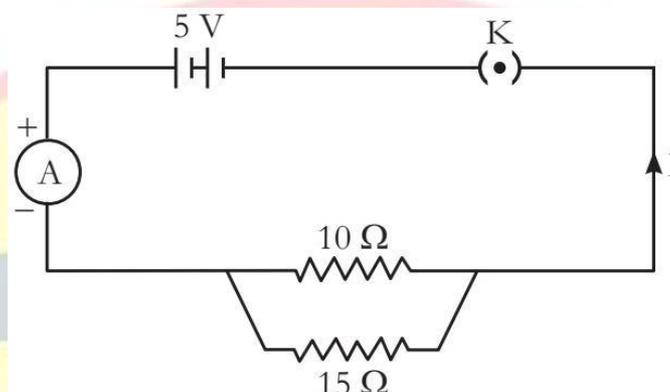
(II) Ammonium sulphate

(ii) Write the nature, acidic/basic/neutral, of each of the above mentioned salts, giving reason for your answer.

28. A cross was carried out between pure breed tall pea plant with pure dwarf pea plant and F1 progeny was obtained. Later, F1, progeny was selfed to obtain F2 progeny. Answer the following questions:

- What is the phenotype of the F1 progeny and why?
- Give the phenotypic ratio of the F2 progeny.
- Why is F2 progeny different from the F1 progeny?

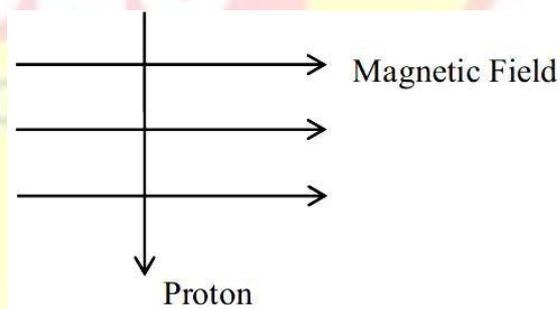
29. Study the following circuit and answer the questions that follows:



- State the type of combination of two resistors in the circuit.
- How much current is flowing through (i) 10 Ohms and (ii) 15 Ohms resistor?
- What is the ammeter reading?

30. (a) Name a part of the flower which (i) persists even after a fruit is formed, (ii) attracts insects for pollination, (iii) produces pollen grains and (iv) changes into seed after fertilisation.
 (b) After pollination, how does a male germ cell reach the ovary? Mention the significance of this event.

31. (a) State (i) right-hand thumb rule, and (ii) Fleming's left-hand rule.
 (b) Using Fleming's left-hand rule determine the direction of force experienced by a proton, which enters vertically downwards in a uniform magnetic field acting horizontally from west to east as shown in the diagram.



32. Rakesh performed the experiment to study the dispersion of light by a glass prism and drew the following figure.
 (a) The colour at position marked 3 and 5 are similar to the colour of the sky and the colour of gold metal respectively. Is the above statement made by the student correct or incorrect? Justify.
 (b) Which of the above shown positions correspond approximately to the colour of:

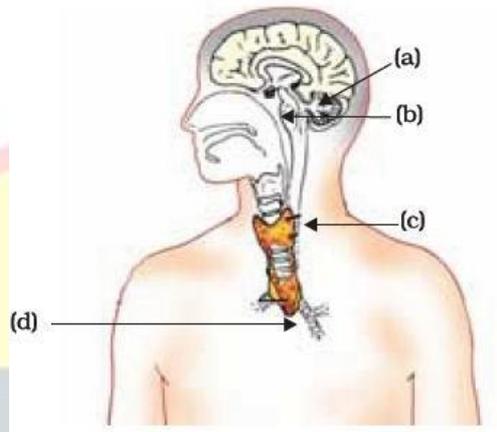
(i) a solution of potassium permanganate?

(ii) danger or stop signal lights?

SECTION – D

Questions 34 to 36 carry 5 marks each.

33. (a) (i) Label the endocrine glands given in figure below:



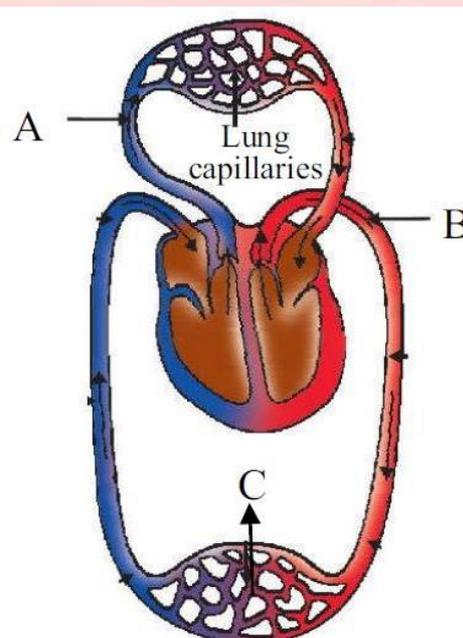
(ii) A hot object has been touched by you. Draw a diagram that shows the steps that result in a response, such as a hasty hand pullback.

(iii) How are involuntary actions and reflex actions different from each other?

OR

(b) (i) Study the diagram below showing schematic representation of transport and exchange of gases in human heart and name the parts labelled as A, B and C. Mention the function of each part.

(ii) Explain how separation of right and left side of the heart is useful for birds.



34. (a) (i) Write the relation between the electrical resistivity 'r' and the resistance 'R' of a cylindrical conductor of length 'l' and area of cross-section 'A'. Use this relationship to determine the SI unit of 'r'.

(ii) Find the electrical resistivity of the material of a wire of length 120 cm and diameter 0.4 mm. The resistance of this wire is 3 W.

OR

(b) (i) What is meant by heating effect of electric current ? Derive an expression for the amount of heat produced in a conductor of resistance R through which a current I flows for a time t.

(ii) Calculate the amount of heat produced in a conductor of resistance 10 W through which a current of 2 A flows for 100 seconds.

35. (a) Write electronic configurations of two elements X (At. no. 12) and Y (At. no. 17). Show the formation of ionic compound when X and Y combine with each other. Write the name and formula of the compound formed. State what would happen if electric current is passed through the aqueous solution of this compound. Name the ion that will reach at (i) cathode, and (ii) anode.

OR

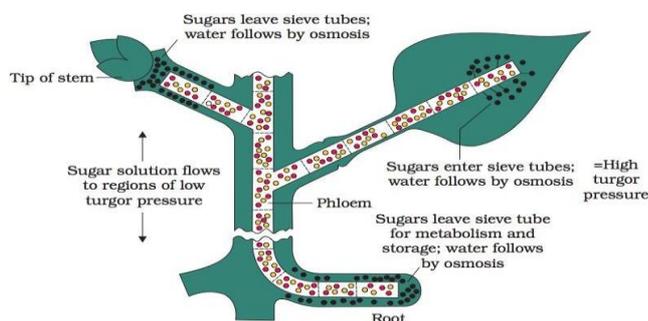
(b) (i) Write the name of two metals of moderate reactivity. Which one of the two is more reactive ? How can this fact be demonstrated experimentally in a school laboratory?

(ii) Some metals of moderate reactivity are also found in the Earth's crust in the form of their carbonates. Name the processes involved in the extraction of metal from them, giving chemical equations for the reactions that occur.

SECTION – E (Case Study Based Questions)

Questions 37 to 39 carry 4 marks each.

36. Have you ever wondered how water reaches the top of tall trees, or for that matter how and why substances move from one cell to the other? Plants need to move molecules over very long distances, much more than animals do; they also do not have a circulatory system in place. Water taken up by the roots has to reach all parts of the plant, up to the very tip of the growing stem. The photosynthates or food synthesised by the leaves have also to be moved to all parts including the root tips embedded deep inside the soil. Movement across short distances, say within the cell, across the membranes and from cell to cell within the tissue has also to take place. Over small distances substances move by diffusion and by cytoplasmic streaming supplemented by active transport. Transport over longer distances proceeds through the vascular system (the xylem and the phloem) and is called translocation.



The table below gives the results of an experiment carried out to study the factors affecting the rate of transpiration:

Amount of water transpired in 1 Hour (ml)				
	Normal	With Fan	With Heater	With Lamp
Arrowhead	3.6	7.5	6.6	4
Coleus	0.9	6	3.9	3
Devil's Ivy	2.9	4.6	4.1	3
Dieffenbachia	4.1	7.7	6	3.9
English Ivy	1.8	5.1	3.2	2.1
Geranium	1.2	4.7	5.8	2.4
Rubber Plant	4.9	8.4	6.8	4.3
Weeping Fig	3.3	6.1	4.9	2.5
Zebra Plant	4.2	7.6	6.1	3.2

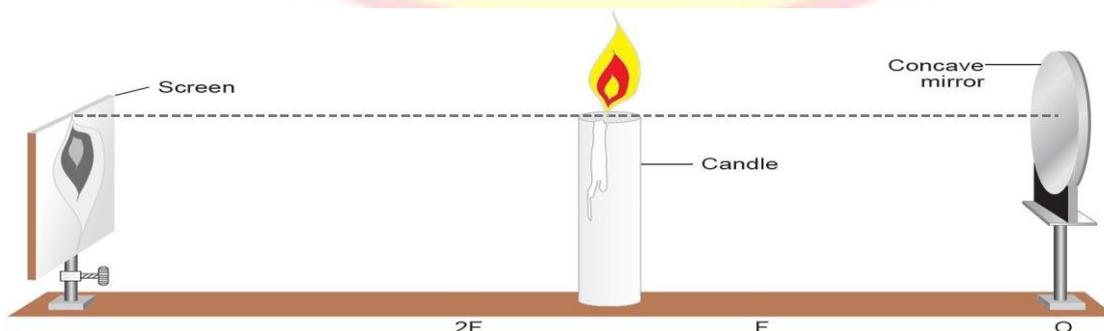
- (a) What do we call the absorption and upward movement of minerals from roots to leaves.
- (b) Root pressure is involved in transpiration. Is this statement true?
- (c) Effect of root pressure in transport of water is more important at night. Justify.

OR

- (c) What is the function of phloem?

37. We know that the characteristics of image formed by a concave mirror depend on the position of the object with respect to the mirror.

When an object is placed between F and infinity, the image formed is real and inverted. But when the object is placed between F and mirror it cannot be obtained on the screen. The image formed in this case is virtual, erect and magnified. Such image may be seen by looking in the mirror directly.



When the object is moved from focus towards infinity, the image moves from infinity towards focus and its size decreases.

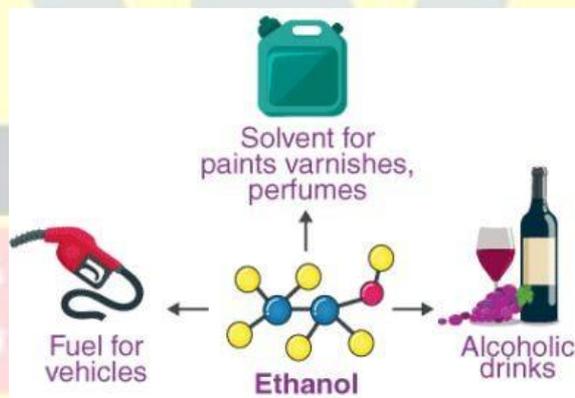
When object is placed at 2F image of the same size is formed at 2F, itself.

- (i) What will be the nature of image if an object is placed 10 cm in front of a concave mirror of focal length 20 cm?
- (ii) What is the minimum distance between the object and its real image for concave mirror?
- (iii) A candle flame 3 cm high is placed at a distance of 3 m from a wall. How far from the wall must a concave mirror be placed in order that it may form an image of the flame 9 cm high on the wall?

OR

(iii) Draw a ray diagram when an object is placed near a concave mirror at a distance of one-fourth the radius of curvature of the concave mirror?

- 38.** Ethanol (commonly known as alcohol) is an important carbon compound widely used in industries, hospitals, etc. Because it is a very good solvent, it is used in medicines such as cough syrups, tincture iodine and many tonics. As it is a cleaner fuel, ethanol is used as an additive in petrol in most of the developed countries of the world.



- (a) Write the structure of ethanol. (1)
- (b) Name the products formed when ethanol burns in sufficient air (oxygen). (1)
- (c) (i) State what happens when 5% solution of alkaline potassium permanganate is added to warm ethanol. Draw the structure of the product formed and state the role of 5% solution of alkaline potassium permanganate in the reaction. (2)

OR

(c) (ii) State what happens when ethanol is heated with excess conc. H_2SO_4 at 443 K. Draw the structure of the product formed and state the role of conc. H_2SO_4 in the reaction.

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