SET-A

GWPS03A

G-W CLASSES, GONDIA

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GW PARIKSHA-03

SUBJECT: SCIENCE **MAX. MARKS: 80**

CLASS : X **TIME -: 3 HRS**

General Instruction:

(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.*

(iii) ***Section-A*** *has Q1 to Q9 carrying 1 mark each, Q10 to Q12 carrying 2 marks each, Q13 to Q14 carrying 3 marks, Q15 carrying Case Study Question of 4 marks and Q16 carrying 5 marks.*

(iv) ***Section-B*** *has Q17 to Q24 carrying 1 mark each, Q25 carrying 2 marks, Q26 to Q27 carrying 3 marks each, Q28 carrying Case Study Question of 4 marks and Q29 carrying 5 marks.*

(v) ***Section-C*** *has Q30 to Q32 carrying 1 mark each, Q33 to Q34 carrying 2 marks each, Q35 to Q37 carrying 3 marks each, Q38 carrying Case Study Question of 4 marks and Q39 carrying 5 marks.*

SECTION – A

1. Mahima went to a nursery along with her parents and saw beautiful flowers. She wondered whether the information she knew was true or not. She wrote few statements. Now find out which of the following statements are true for flowers?

(i) Flowers are produced by both gymnosperms and angiosperms.

(ii) Flowers are sexual reproductive organs.

(iii) Flowers are always bisexual.

(iv) After fertilization , sepals, petals and stamens of the flower fall off.

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

2. Select the incorrect statement. All green plants and blue-green algae are called producers as

(a) they contain chlorophyll and capture the energy from the sun.

(b) they convert solar energy into chemical energy.

(c) they prepare their food using inorganic substances by the process of photosynthesis.

(d) during the processof photosynthesis ,they use oxygen and give out CO_2

3. What prevents backflow of blood inside the heart during contraction?

(a) Valves in heart (b) Thick muscular walls of ventricles

(c) Thin walls of atria (d) Inner lining of the heart

4. Abhir's doctor suggested him to use contraceptive methods to keep a gap between the two children. He thought to use mechanical barrier method which not only prevents sperms to reach the egg but also helps in prevention of transmission of sexually transmitted diseases. Which one of the following method does he use?

(a) Surgical method (b) Use of condom (c) Use of chemicals (c) Use of copper-T

5. The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration. Select the statement which is not related to transpiration.

(a) Transpiration helps in temperature regulation.

(b) Transpiration pull only is enough to move water from roots to the leaves of the plant.

(c) Transpiration helps in the absorption and upward movement of water and minerals dissolved in it from roots to the leaves.

(d) During the day, transpiration pull is the major driving force in the movement of water in the xylem

6. Consider the following statements about contraceptive methods: Which of the statements are correct?

(i) Oral pills are hormonal preparations that prevent the release of an egg from the ovary (ovulation).

(ii) Using a condom is a barrier method that can also prevent the transmission of Sexually Transmitted Diseases (STDs).

(iii) Copper-T is a surgical method used to permanently block the fallopian tubes.

(iv) A vasectomy is a surgical procedure performed on females to prevent pregnancy.

7. On seeing a tiger, Aditi instantly jumped back. She then slowly moved from the spot. Which of the following statements give/s the correct difference between jumping and slowly walking away?

(i) Instant jumping is an involuntary reflex action.

(ii) 'Walking away is a voluntary action controlled by the cerebrum.

(iii) Instant jumping is an involuntary action controlled by the brain.

(iv) Walking away is a voluntary action controlled by the cerebellum.

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

8. **Assertion (A):** The cerebellum is the main thinking part of the brain.
Reason (R): The cerebellum controls the voluntary actions like walking, posture and maintains balance of the body.
(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.**

9. **Assertion (A):** As human beings occupy the topmost level of any food chain, the maximum concentration of these chemicals get accumulated in the human body.
Reason (R): Food chain helps to understand the movement of toxic substances in an ecosystem and the problem of their biological magnification.
(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.**

10.(a) In single-celled organisms, no specific organs for taking in food, exchange of gases or removal of wastes are present. How do these organisms meet their oxygen requirements?
(b) Differentiate between xylem and phloem on the basis of
(i) the direction of flow and (ii) the substance transported.

11.Why is the flow of signals in a synapse from axonal end of one neuron to dendrite end of another neuron but not the reverse?

12. (a) How is human brain protected from injuries and mechanical shocks?
(b) How is spinal cord protected and from where it originates?

13.(a) Classify the given wastes into two categories-biodegradable and non-biodegradable waste. Leather purse, Plastic bag, Fruit peels, Egg shells.
(b) The use of disposable kulhads (earthen cups) is considered a better alternative to plastic cups for serving
(c) tea in trains. Justify this statement by giving two reasons. List one impact of each

type of the accumulated waste on environment if not disposed off properly.

14. Give reasons:

(a) In a bisexual flower, inspite of the young stamens being removed artificially the flower produces fruit.

(b) All multicellular organisms cannot give rise to new individuals through fragmentation or regeneration.

(c) Sperms and ova have half the number of chromosomes whereas the zygote formed after the fertilisation of a sperm and an ovum has same number of chromosomes as parents.

15. To sustain life, our body must produce enough energy which is produced by burning of food molecules in the presence of oxygen. Oxidation of food molecules produces carbon dioxide and water. To take in oxygen and to expel out carbon dioxide, respiratory system is present in human beings. The respiratory system starts at the nose and mouth and continues through the airways and the lungs. The energy released during the process of respiration is used to make an ATP molecule from ADP and inorganic phosphate.

$$ADP + \textcircled{P} \xrightarrow{\text{Energy}} ADP - \textcircled{P} = ATP$$

$\textcircled{P}$: Phosphate

Attempt either subpart (a) or (b)

(a) Name the balloon like structures present in the lungs. List its two functions.

OR

(i) Write the pathway for the breakdown of glucose in yeast cells and in mitochondria

(b) Sometimes you get cramps in your legs. What is the reason behind it?

(c) Blood is red in colour due to the presence of a pigment. Name the respiratory pigment. Where is it present and what is its function?

16. (a) Human beings produce two different types of gametes by the process of cell division i.e. meiosis and gametes have chromosomal difference. What is the importance of the chromosomal difference of the two types of gametes of human beings?

(b) What are chromosomes? Where are they located in the cell?

(c) What is the law of dominance of traits? Explain the law by taking an example of plants having red coloured (RR) and white coloured flowers (rr).

OR

(a) Why is DNA copying necessary during reproduction?

(b) What is law of segregation of traits? Explain the law by taking an example of animals having white fur (WW) and brown fur (ww).

(c) Identify the phenotypes of F1, generation and genotypes of F2, generation where the parent animals have white fur (WW) and calculate the percentage of brown fur animals.

SECTION – B

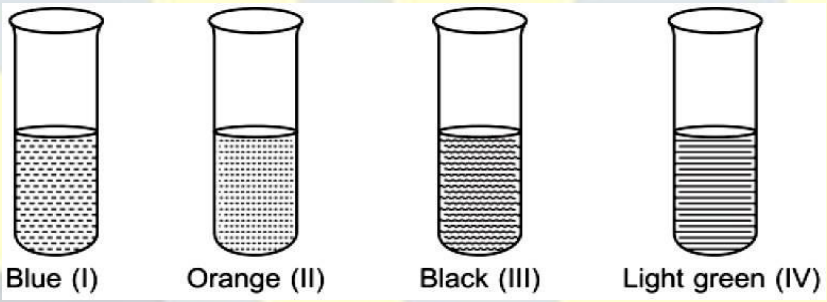
17. Zinc oxide is an amphoteric oxide. When it reacts with a hot, concentrated solution of sodium hydroxide, the salt formed is:

(a) Zinc Hydroxide (b) Sodium Oxide (c) Sodium Zincate (d) Zinc Sulphate

18. Ethanol reacts with Na metal to form

(a) $CH_3ONa + H_2$ (b) $C_2H_5ONa + H$ (c) $CH_3COONa + H_2$ (d) $CH_3COOH + H_2O$

19. Four test tubes, containing unknown solutions, are shown along with colours. $FeSO_4$ is contained in test tube ____.



(a) (II) (b) (IV) (c) (III) (d) (I)

20. Calcium oxide reacts vigorously with water to produce slaked lime. This reaction can be classified as:

$$\mathbf{CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq)}$$

(A) Combination reaction (B) Exothermic reaction

(C) Endothermic reaction (D) Oxidation reaction Which of the following is a correct option?

(a) (A) and (C) (b) (C) and (D (c) (A), (C) and (D) (d) (A) and (B)

21. The following reaction is an example of a

$$\mathbf{4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)}$$

i) Displacement reaction ii. Combination reaction

iii) Redox reaction iv) Neutralisation reaction

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

22. Soda-acid fire extinguishers work by producing carbon dioxide gas, which cuts off the oxygen supply to a fire. The gas is produced by the reaction of sulphuric acid with:

(a) Sodium carbonate (b) Calcium carbonate

(c) Sodium hydroxide (d) Sodium hydrogencarbonate

23. **Assertion (A):** Rubbing baking soda solution on the area stung by a bee gives relief.
Reason (R): Baking soda is base and neutralises the effect of methanoic acid injected into the area by the insect.

(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.

24. Zinc oxide is an amphoteric oxide. When it reacts with a hot, concentrated solution of sodium hydroxide, the salt formed is:

(a) Zinc Hydroxide (b) Sodium Oxide

(c) Sodium Zincate (d) Zinc Sulphate

25. Write the electron dot structure of ethane (C_2H_6) and ethene (C_2H_4).

26. A carboxylic acid $C_2H_4O_2$ reacts with an alcohol in the presence of H_2SO_4 to form a compound 'X'. The alcohol on oxidation with alkaline $KMnO_4$ followed by acidification gives the same carboxylic acid, $C_2H_4O_2$. Write the name and structure of (a) carboxylic acid, (b) alcohol and (c) compound 'X'.

27. Draw a neat and fully labelled diagram showing the setup for the electrolytic refining of an impure copper rod. Your diagram must show the anode, cathode, electrolyte, and the collection of anode mud.

OR

Explain the following:

(a) Sodium chloride is an ionic compound which does not conduct electricity in solid state whereas it does conduct electricity in molten state as well as in aqueous solution.

(b) Reactivity of aluminium decreases if it is dipped in nitric acid.

(c) Metals like calcium and magnesium are never found in their free state in nature.

28. **Case Study:** The table given below shows pH values obtained for solutions A, B, C, D and E when tested with universal indicator.

Solution	**pH**
A	4
B	1
C	11
D	7
E	9

(a) Which of these solutions could possibly react with zinc metal to produce H_2 gas?

(i) Solution B (ii) Solution D (iii) Solution E Justify your answer.

(b) What are strong and weak acids? In the following list separate strong from weak acids: Citric acid, Nitric acid, Acetic acid, Hydrochloric acid, Sulphuric acid and Formic acid.

OR

What type of salt will be formed when solution B is mixed with solution E and why? What is the nature of solution D?

(c) Which of these solutions could be the raw material for industrial manufacturing of chlorine?

(i) Solution A (ii) Solution B (iii) Solution C (iv) Solution D Justify your answer.

29. (a) What is an oxidation reaction? Give an example. Is oxidation exothermic or endothermic?

(b) When the powder of a reddish-brown coloured metal is heated in an open china dish, its colour turns black. However, when hydrogen is passed over the hot black substance so formed, it regains its original colour. Based on the above information answer:

(i) What type of chemical reaction takes place in each step?

(ii) Name the metal initially taken in powdered form. Write balanced chemical equations for both reactions.

OR

A metal nitrate 'A' on heating gives yellowish-brown metal oxide along with brown gas 'B' and a colourless gas 'C'. Aqueous solution of 'A' on reaction with potassium iodide forms a yellow precipitate of compound 'D'. Identify 'A', 'B', 'C', 'D'. Also identify both types of reactions.

SECTION – C

30. A student makes the following statements about image formation by a concave lens:

I. A concave lens always forms a virtual and erect image.

II. The image formed by a concave lens is always diminished.

III. The focal length of a concave lens is considered positive.

Choose from the following the correct option that lists the correct statements.

(a) I and II (b) I and III (c) I, II and III (d) II and III

31. Which of the following is an example of total internal reflection?

(a) The glittering of a diamond

(b) The blue color of the sky

(c) The formation of a shadow

(d) The functioning of a magnifying glass

32. **Assertion (A):** The power of a lens increases when its focal length decreases.

Reason (R): The power of a lens is inversely proportional to focal length.

(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.**

33. (i) Why is the tungsten used almost exclusively for filament of electric lamps?

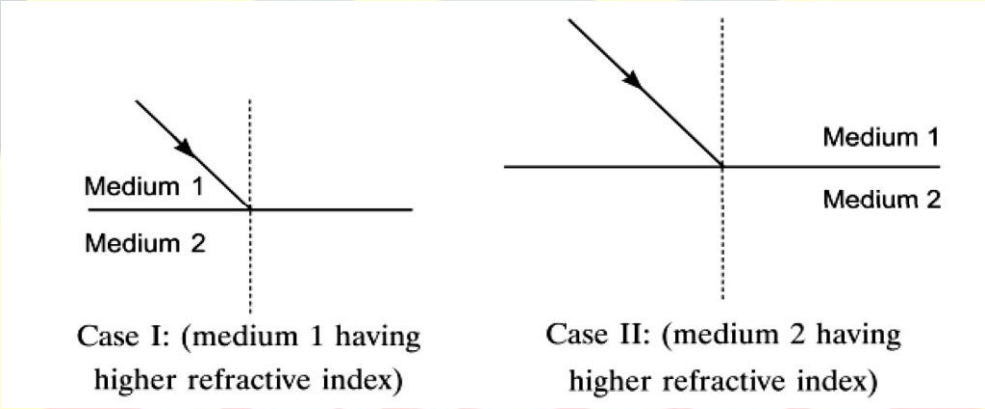
(ii) Why are the conductors of electric heating devices, such as bread-toasters and electric irons, made of an alloy rather than a pure metal?

OR

(i) Why is the series arrangement not used for domestic circuits?

(ii) Why are copper and aluminium wires usually employed for electricity transmission?

34. For the following two cases, state whether the obliquely incident ray light on interface of medium 1 and medium 2 will bend towards or away from the normal after refraction, in medium also trace the path of refraction.



Case I: (medium 1 having higher refractive index)

Case II: (medium 2 having higher refractive index)

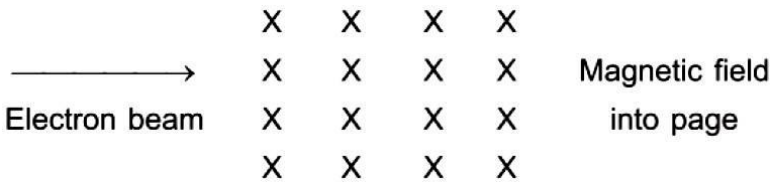
35. (a) How is the direction of magnetic field lines inside a bar magnet different from outside the bar magnet?

(b) The magnetic field lines in a given region are getting crowded. What does it indicate?

(c) Why do not two magnetic lines of force intersect each other?

36. A fuse wire melts at 5 A. If it is desired that the fuse wire of the same material melt at 10 A, then should the new fuse wire be of smaller or larger radius than the earlier one? Give reason for your answer.

37. The diagram shows a beam of electrons about to enter a magnetic field. The direction of the field is into the page.



'What will be the direction of deflection, if any, as the beam passes through the field. State the rule that is used for the determination of the same.?

38. Naina along with her friends went for boating in a nearby lake. They planned to catch a fish while boating. Naina tried to catch it, thinking that it was very close to the boat. But it was not as the fish was deep in water. In doing so Naina fell into the water also.

(a) Why did the fish appear close to the boat to Naina?

(b) State two examples of phenomenon of refraction of light in everyday lifesituations.

(c) What is the cause of refraction of light? State the two conditions in which no refraction of light occurs.

OR

(d) A pond of depth 30 cm is filled with water of refractive index 5/3. Calculate the apparent depth of the tank when viewed normally.

39.(a) Dimpy is unable to see distinctly the words printed on a newspaper. Identify the defect of vision she has. What are the reasons that cause this defect? Draw a figure showing (i) the defected eye and (ii) the eye after correction.

(b) What is dispersion of light? Name component of white light that deviate (i) the least (ii) the most while passing through a glass prism.

OR

(a) A person needs a lens of power –2.5D for correction of his vision.

(i) What kind of defect in vision is he suffering from and what are the causes of this defect?

(ii) Calculate the focal length of the corrective lens and find out the nature of the corrective lens.

(b) An object 5 cm in length is placed 25 cm away from a convex lens of focal length 10 cm.

A. Use the lens formula to calculate the image distance.

B. Find the size of the image using magnification.

C. State the nature of the image.