G-W CLASSES, GONDIA

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SUBJECT: SCIENCE **MAX. MARKS: 80**
CLASS : X **TIME: 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

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. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?
   (a) Lemon juice (b) Vinegar (c) Common salt (d) An antacid

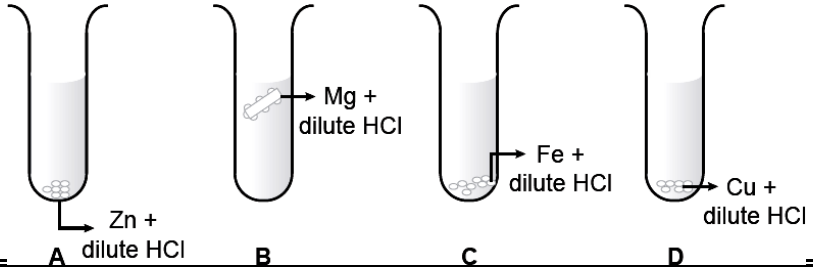
2. Generally metals react with acids to give salt and hydrogen gas. Which of the following acids does not give hydrogen gas on reacting with metals (except Mn and Mg)?
   (a) H_2SO_4 (b) HCl (c) HNO_3 (d) All of these

3. Identify the unsaturated compounds from the following
   (i) Propane (ii) Propene (iii) Propyne (iv) Chloropropane
   (a) (i) and (ii) (b) (ii) and (iv) (c) (iii) and (iv) (d) (ii) and (iii)

4. Which one among the following is not removed as a waste product from the body of a plant?
   (a) Resins and Gums (b) Urea (c) Dry Leaves (d) Excess Water

5. Which of the following statement is incorrect?
   (a) For every hormone there is a gene.
   (b) For every protein there is a gene.
   (c) For production of every enzyme there is a gene.
   (d) For every molecule of fat there is a gene.

6. The diagram shows the reaction between metal and dilute acid.



What is the reason for different behaviour of Mg in test tube B?

(a) Mg is lighter element than dil. HCl

(b) Mg reacts with dil. HCl to produce H_2 gas which helps in floating

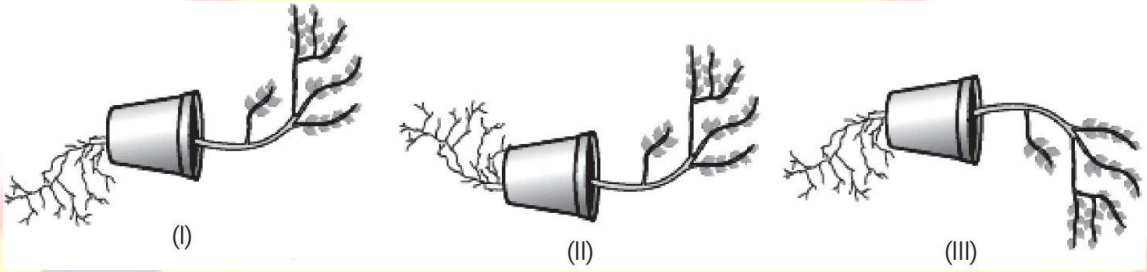
(c) Mg reacts with dil. HCl to produce N_2 gas which helps in floating

(d) Mg reacts with dil. HCl to produce CO_2 gas which helps in floating

7. A student adds an equal amount of copper sulphate solution in two beakers. He adds zinc in beaker P and silver in beaker Q. The student observes that the color of the solution in beaker P changes while no change is observed in beaker Q. Which option arranges the metals in increasing order of reactivity?

(a) Copper-silver-zinc (b) Zinc-copper-silver (c) Silver-copper-zinc (d) Silver-zinc-copper

8. Mohan was confused and did not know how to draw the correct figure for geotropism. So, he has drawn three figures, as shown below.



Which appears more accurate and why?

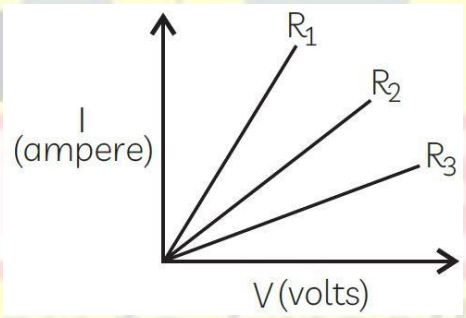
(a) (I), (II) (b) (I) only (c) (II), (III) (d) (II) only

9. Select the mismatched pair

(a) Adrenaline: Pituitary gland (b) Testosterone: Testes

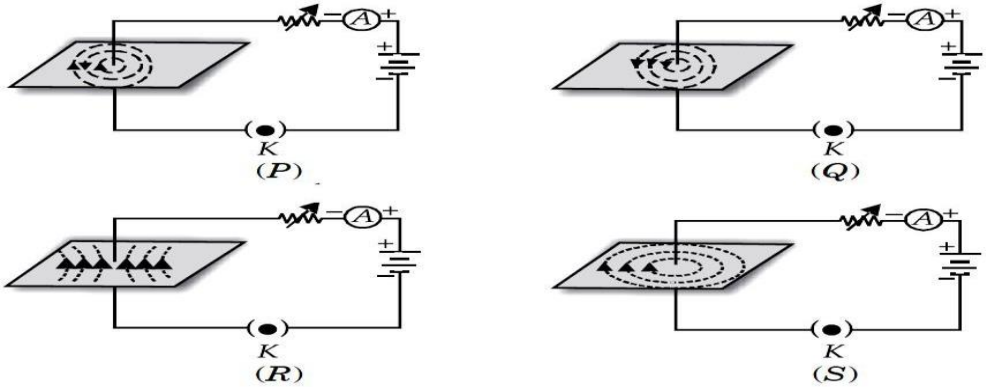
(c) Estrogen : Ovary (d) Thyroxin: Thyroid gland

10. A student carries out an experiment and plots the V - I graph of three samples of nichrome wire with resistances R_1, R_2 and R_3 respectively as shown in figure. Which of the following is true?



(a) $R_1 = R_2 = R_3$ (b) $R_1 > R_2 > R_3$ (c) $R_3 > R_2 > R_1$ (d) $R_2 > R_3 > R_1$

11. Four students plotted the sketch of the patterns of magnetic field lines representing the magnetic field around a current carrying straight wire as shown in figures P, Q, R and S. Which one of the following sketches is correct?



(a) P (b) Q (c) R (d) S

12. Offspring formed by asexual method of reproduction have greater similarity among themselves because

(i) asexual reproduction involves only one parent

(ii) asexual reproduction does not involve gametes

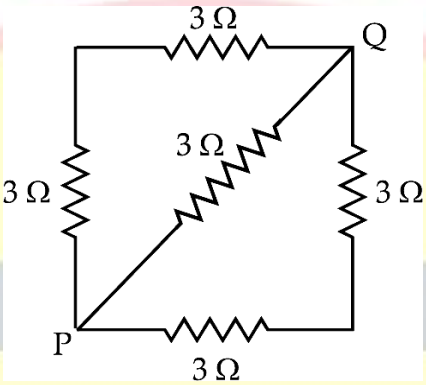
(iii) asexual reproduction occurs before sexual reproduction

(iv) asexual reproduction occurs after sexual reproduction

(a) (i) and (ii) (b) (i) and (iii)

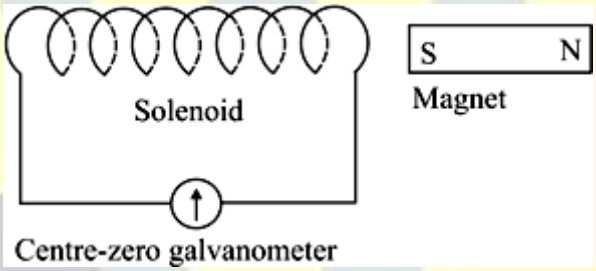
(c) (ii) and (iv) (d) (iii) and (iv)

13. What is the effective resistance between points P and Q in the circuit shown below?



(a) 0.15 Ω (b) 0.66 Ω (c) 1.5 Ω (d) 1.75 Ω

14. In the given diagram, when the magnet is pushed into the solenoid, the pointer of



the galvanometer deflects slightly to the left.

Which of the following would produce a deflection of the pointer towards the right?

(a) Move the solenoid towards the magnet.

(b) Move the solenoid away from the magnet.

(c) Move the magnet faster into the solenoid.

(d) By placing the magnet above the coil.

15. What happens when a solution of an acid is mixed with a solution of a base in a test tube?

(i) The temperature of the solution increases

(ii) The temperature of the solution decreases

(iii) The temperature of the solution remains the same

(iv) Salt formation takes place

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

16. Which of the following reactions is a neutralisation reaction?

(a) $4Na + O_2 \rightarrow 2Na_2O$

(b) $Fe + 2HCl \rightarrow FeCl_2 + H_2$

(c) $MgO + H_2O \rightarrow Mg(OH)_2$

(d) $HNO_3 + NaOH \rightarrow NaNO_3 + H_2O$

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: The chemical name of bleaching powder is calcium oxychloride.
Reason: Bleaching powder is used as an oxidising agent in chemical industries.

18. Assertion (A) : Acquired traits cannot be passed from one generation to next generation.
Reason (R) : Inaccuracy during DNA copying of acquired trait is minimum.

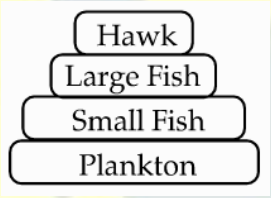
19. Assertion (a): The opening and closing of the pore is a function of the guard cells.
Reason (R): Stomatal pores are the site for exchange of gases by diffusion.

20. Assertion (A) : The compass placed near the current-carrying wire remains stationary.
Reason (R) : The current flowing through a wire gives rise to a magnetic field.

SECTION – B

Questions 21 to 25 carry 2 marks each.

21. DDT was sprayed in a lake to regulate breeding of mosquitoes. How would it affect the trophic levels in the following food chain associated with a lake? Justify your answer.



22. List in tabular form three distinguishing features between cerebrum and cerebellum.

23. Define the term power of accommodation. Write the modification in the curvature of the eye lens which enables us to see the nearby objects clearly? Give relation between power and focal length.

OR

Why is the sun visible to us 2 minutes before actual sunrise and 2 minutes after actual sunset?

24. What changes are observed in the uterus subsequent to implantation of young embryo?

25. Why do fire flies glow at night?

OR

A dilute ferrous sulphate solution was gradually added to the beaker containing acidified potassium permanganate solution. The light purple colour of the solution fades and finally disappears. Write the correct explanation for this observation.

26. Answer the following:
(i) Which hormone is responsible for the changes noticed in females at puberty?
(ii) Dwarfism results due to deficiency of which hormone?
(iii) Blood sugar level rises due to deficiency of which hormone?
(iv) Iodine is necessary for the synthesis of which hormone?

SECTION – C

Questions 27 to 33 carry 3 marks each.

27. 1 g of copper powder was taken in a China dish and heated. What change takes place on heating? When hydrogen gas is passed over this heated substance, a visible change is seen in it. Give the chemical equations of reactions, the name and the color of the products formed in each

case.

28. State the events occurring during the process of photosynthesis. Is it essential that these steps take place one after the other immediately?

OR

Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion. Justify the statement.

29. Based on the group valency of elements, write the molecular formula of the following compounds giving justification for each:

(a) Oxides of first group elements.

(b) Halides of the elements of group 13.

(c) Compounds formed when an element A of group 2 combines with an element B of group 17.

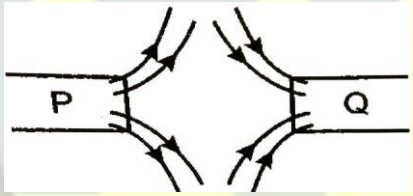
30. A student holding a mirror in his hand, directed the reflecting surface of the mirror towards the Sun. He then directed the reflected light on to a sheet of paper held close to the mirror.

(a) What should he do to burn the paper?

(b) Which type of mirror does he have?

(c) Will he be able to determine the approximate value of focal length of this mirror from this activity? Give reason and draw ray diagram to justify your answer in this case.

31. (a) Determine whether the P and Q-marked poles in the following diagram represent the North or South pole. Why did you choose that response?



(b) Imagine that you are sitting in a chamber with your back to one wall. An electron beam, moving horizontally from back wall towards the front wall, is deflected by a strong magnetic field to your right side. What is the direction of magnetic field?

OR

State the rule to determine the direction of a (a) magnetic field produced around a straight conductor-carrying current and (b) force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it.

32. Plastic cups were used to serve tea in trains in early days—these could be returned to the vendors, cleaned and reused. Later, Kulhads were used instead of plastic cups. Now, paper cups are used for serving tea. What are the reasons for the shift from Plastic to Kulhads and then finally to paper cups?

33. A lens produces a magnification of –0.5. Is this a converging or diverging lens? If the focal length of the lens is 6 cm, draw a ray diagram showing the image formation in this case.

SECTION – D

Questions 34 to 36 carry 5 marks each.

34. Explain Mendel's experiment with peas on inheritance of characters considering only one visible contrasting character.

OR

In the following crosses write the characteristics of the progeny.

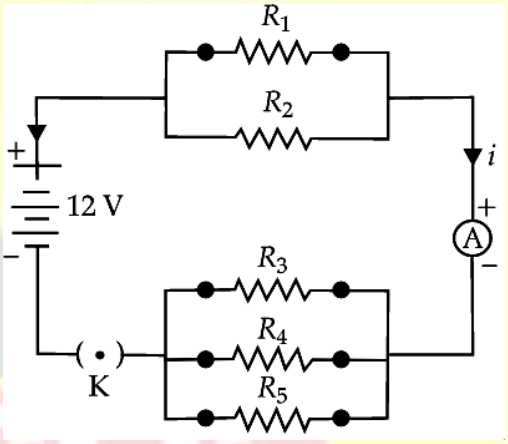
Cross	Progeny
(i) RR YY × RR YY Round, yellow and round, yellow	
(ii) Rr Yy × Rr Yy Round, yellow and round, yellow	
(iii) rr yy × rr yy Wrinkled, green and wrinkled, green	
(iv) RR YY × rr yy Round, yellow and wrinkled, green	

35. What is a homologous series of carbon compounds? List its any two characteristics. Write the name and formula of the next higher homologous of HCOOH.

OR

A compound C (molecular formula, $C_2H_4O_2$) reacts with Na-metal to form a compound R and evolves a gas which burns with a pop sound. Compound C on treatment with an alcohol A in presence of an acid forms a sweet smelling compound S (molecular formula $C_3H_6O_2$). On addition of NaOH to C, it also gives R and water. S on treatment with NaOH solution gives back R and A.
Identify C, R, A, S and write down the reactions involved.

36. If, in Figure R_I = 10 Ohms, R_2 = 40 Ohms, R, = 30 Ohms, R_4 = 20 Ohms, R_A = 60 Ohms and a 12 volt battery is connected to the arrangement, calculate:
(a) the total resistance and (b) the total current flowing in the circuit.



SECTION – E(Case Study Based Questions)

Questions 37 to 39 carry 4 marks each.

Sohan went door to door posing as a goldsmith. He promised to bring back the glitter of old and dull gold ornaments. An unsuspecting lady gave a set of gold bangles to him, which he dipped in a particular solution. The bangles sparkled like new but their weight was reduced drastically.

The lady was sad but after a futile argument, the man beat a hasty retreat.

(b) What is used for dissociation of gold? [1]

(c) Why the weight of the bangle was reduced drastically? [1]

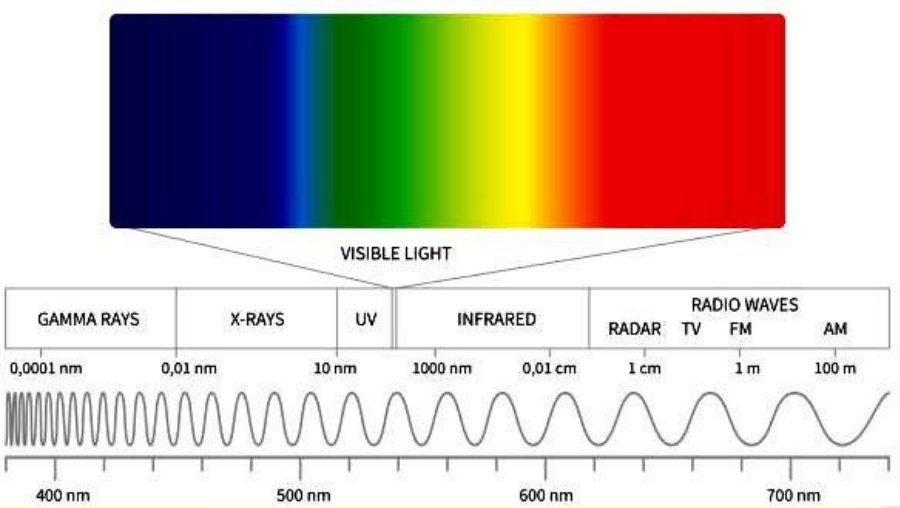
(d) Aqua-regia is a strong oxidising agent. (True or False). [2]

OR

(c) What is the other name of the solution (in Latin) used by that man posing as the goldsmith? Why is it so called?

37. Case Study – 2

Light spectrum is the many different wavelengths of energy produced by light source. Light is measured in nanometers (nm). Each nanometer represents a wavelength of light or band of light energy. Visible light is the part of spectrum from 380 nm to 780 nm.



Isaac Newton was the first to use a glass prism to obtain the spectrum of sunlight. He tried to split the colours of the spectrum of white light further by using another similar prism. He then placed a second identical prism in an inverted position with respect to the first prism. This allowed all the colours of the spectrum to pass through second prism. He found a beam of white light emerging from the other side of the second prism. This observation gave Newton the idea that the sunlight is made up of seven colours.

(i) (a) What is the range of wavelength of visible light spectrum?

(b) What do you understand by light spectrum?

(ii) Explain the process of refraction when critical angle between an equilateral prism and air is 45 degree, if the incident ray is perpendicular to the refracting surface?

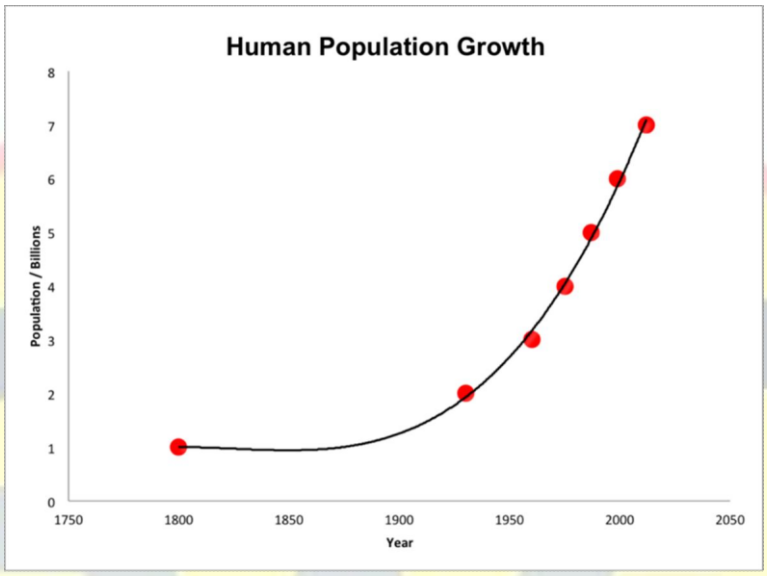
OR

(ii) (a) Why do different rays deviate differently in the prism?

(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?

38. Case Study – 3

The growing size of the human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size. The human population growth year wise is shown in the below figure. Reproduction is the process by which organisms increase their population. The process of sexual maturation for reproduction is gradual and takes place while general body growth is still going on. Some degree of sexual maturation does not necessarily mean that the mind or body is ready for sexual act or for having and bringing up children. Various contraceptive devices are being used by human beings to control the size of population.



(a) List two common signs of sexual maturation in boys and girls.
(b) What is the result of reckless female foeticide?
(c) Which contraceptive method changes the hormonal balance of the body? Give an example of it

OR

Write two factors that determine the size of a population.

"Success is not final; failure is not fatal: It is the courage to continue that counts."