Er Manish Bhadoria's
Interactions Study Circle
Strong Foundation for a bright future

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Science

Board Exam 2023 **Sample Paper No. 3** **Class 10th**

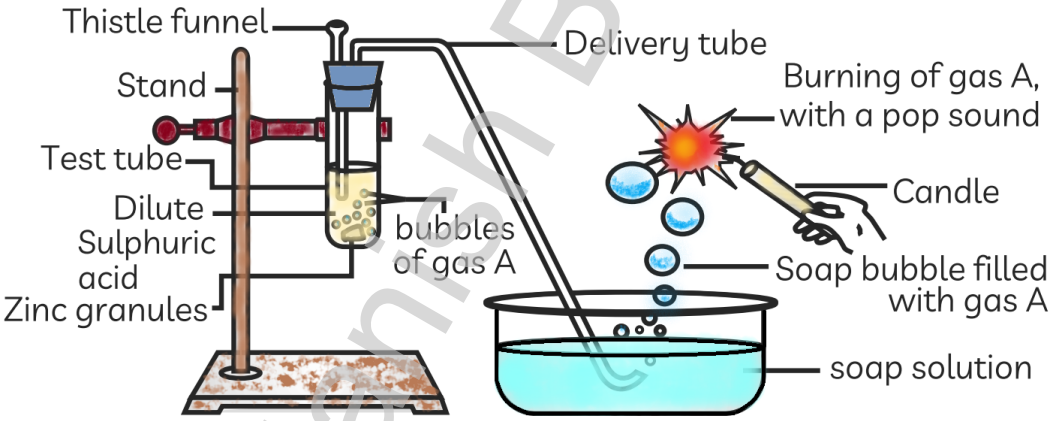
Time: 3 h **Marks: 80**

Section	A	B	C	D	E
Q. No.	1 – 20	21 – 26	27 – 33	34 – 36	37 – 39
Marks	1	2	3	5	4
Type	MCQ	V. S. A. Type	S. A. Type	L. A. Type	Case Study Based

Section A

1. The electronic configurations of three elements X, Y and Z are
X = [2, 8] Y = [2, 8, 7] Z = [2, 8, 2]
Which of the following is correct?
(a) X is a metal (b) Y is a metal
(c) Z is a non-metal (d) Y is a non-metal and Z is a metal

2. Identify gas A in the following experiment.



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

3. The value of *p*, *q*, *r* and *s* in balanced chemical equation :
$p\ BaCl_2 + q\ Al_2(SO4)3 \rightarrow r\ AlCl_3 + s\ BaSO_4$ are respectively.
(a) 3, 2, 2, 3 (b) 3, 1, 2, 3 (c) 3, 1, 3, 3 (d) 3, 1, 3, 2

4. The chemical formula of few hydrated salts is given in the table below.

	Name of salt	Chemical formula
(I)	Gypsum	$CaSO_4.2H_2O$
(II)	Washing soda	$Na_2CO_3.5H_2O$
(III)	Copper Sulphate	$CuSO_4.10H_2O$
(IV)	Plaster of Paris	$CaSO_4.\frac{1}{2}H_2O$

Select the rows containing the incorrect number of molecules of water of crystallization in each salt.
(a) Both (I) and (II) (b) Both (II) and (III)
(c) Both (I) and (III) (d) Both (III) and (IV)

5. What happens when calcium is treated with water?
(i) It does not react with water
(ii) It reacts violently with water
(iii) It reacts less violently with water
(iv) Bubbles of hydrogen gas formed stick to the surface of calcium
(a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (ii) (d) (iii) and (iv)

6. Acid rain water flowing into a river affects aquatic life by:
(a) contaminating the water (b) lowering the pH of water
(c) increase the pH of water (d) deposit harmful metals into water bodies

7. The functional group in methanol and methanal respectively are:
(a) -OH, -CHO (b) -CHO, -OH (c) -OH, -COOH (d) -CHO, -COOH

8. The internal energy (cellular energy) reserve in autotrophs is:
(a) proteins (b) fatty acids (c) glycogen (d) starch

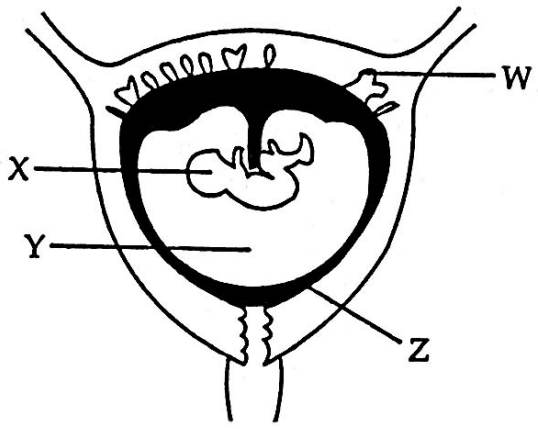
9. Which blood vessel does not carry any carbon dioxide?
(a) pulmonary artery (b) vena cava (c) hepatic vein (d) pulmonary vein

10. If a trait A exists in 10% of a population of an asexually reproducing species and a trait B exists in 60% of the same population, which trait is likely to have arisen earlier?
(a) Trait A (b) Trait B (c) Both A and B (d) Can not say

11. Which of the following is a plant hormone?
(a) Insulin (b) Thyroxin (c) Oestrogen (d) Cytokinin

12. Which of the following are the functions of Y?
I. It acts as a shock absorber
II. It supplies nutrients to the foetus.
III. It supports the foetus.
IV. It insulates the baby.

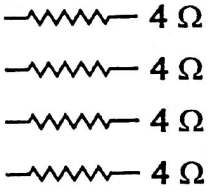
(a) only I and II (b) only I and III
(c) I, II and III only (d) all of these



13. The magnification *m* of an image formed by a spherical mirror is negative. It means, the image
(a) is smaller than the object (b) is larger than the object (c) is erect (d) is inverted

14. The clear sky appears blue because
(a) blue light gets absorbed in the atmosphere
(b) ultraviolet radiations are absorbed in the atmosphere
(c) violet and blue lights get scattered more than lights of all other colours by the atmosphere
(d) light of all other colours is scattered more than the violet and blue colour lights by the atmosphere

15. What is the minimum resistance which can be made using the following resistors?
(a) 1 Ω (b) 2 Ω (c) 3 Ω (d) 4 Ω



16. For a current in a long straight solenoid N-pole and S-pole are created at the two ends. Among the following statements, the incorrect statement is:
(a) The field lines inside the solenoid are in the form of straight lines which indicates that the

magnetic field is the same at all points inside the solenoid.
(b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil.
(c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet
(d) The N-pole and S-pole exchange position when the direction of current through the solenoid is reversed.

DIRECTIONS: In the questions numbered 17 to 20, a statement of **assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option.
(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 reason **R** is false.
(d) **A** is false but reason **R** is true.

17. **Assertion (A):** Sodium carbonate is commonly used as an ingredient in antacid tablets.
Reason (R): Sodium carbonate is a basic salt.
18. **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.
19. **Assertion (A):** The rate of breathing in aquatic organisms is much faster than in terrestrial organisms.
Reason (R): The amount of oxygen dissolved in water is much lower than the amount of oxygen in air.
20. **Assertion (A):** A moving charge interacts with a magnetic field, but a stationary charge does not.
Reason (R): Moving charges generate magnetic fields.

Section B

21. The atomic number of an element 'X' is 11.
(i) Write the electronic configuration of 'X' and find its valency.
(ii) Write the formula and nature of its oxide.
22. How do sensory and motor neurons differ from each other?
23. What is puberty? Mention any two changes that are common to both boys and girls in early teenage years.
24. What are the differences between the transport of materials in xylem and phloem?
25. What are the causes of the following defects of vision and how can they be corrected?
(a) Cataract (b) Presbyopia
26. (a) What is meant by garbage? List two classes into which garbage is classified.
(b) What do we actually mean when we say that the "enzymes are specific in their action."?

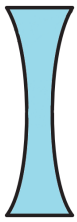
Section C

27. What reaction occurs when lead nitrate solution reacts with potassium iodide solution? Write balanced chemical equation. Does any precipitate form in this reaction? What is the color of this precipitate?
28. (a) Rahul used to eat lot of sweets. As a result his teeth started damaging so early. How is

tooth decay related to pH?
(b) What is the change in colour of pH paper dipped in a solution having a pH = 13?
(c) How can tooth decay be prevented?

29. Answer the following:
(a) Mention the adaptations of leaf for photosynthesis.
(b) Why does absorption of digested food occur mainly in small intestine?

30. (a) What is the focal length of the given lens (see figure) if its power is – 4 D? (1 mark)
(b) An object is kept at a distance of 100 cm from the above lens. Calculate the image distance and the magnification. (2 marks)



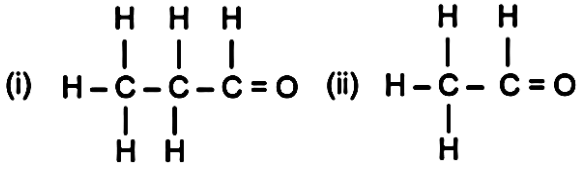
31. An object of 4.0 cm size is placed at a distance of 25 cm from a concave mirror of focal length 15 cm. at what distance from the mirror should a screen be placed to obtain a sharp image of the object? Find the nature and size of the image formed.

32. Draw the pattern of magnetic field lines produced around a current carrying straight conductor held vertically on a horizontal cardboard. Indicate the direction of the field lines as well as the direction of current flowing through the conductor.

33. (a) We do not clean ponds or lakes, but an aquarium needs to be cleaned regularly. Why? (1 mark)
(b) Why is ozone layer getting depleted at the higher levels of the atmosphere? Mention one harmful effect caused by its depletion. (2 marks)

Section D

34. Consider these two organic compounds:



(a) Name the functional group present in both of these compounds.
(b) Write the general formula for the compounds of this functional group.
(c) State the relationship between these compounds and draw the structure of any other compound having similar functional group.
(d) Draw the electron dot structure for ethyne.
(e) List any one major difference between the properties exhibited by covalent compounds and ionic compounds.

35. Mendel blended his knowledge of Science and mathematics to keep the count of the individuals exhibiting a particular trait in each generation. He observed a number of contrasting visible characters controlled in pea plants in a field. He conducted many experiments to arrive at the laws of inheritance.
(a) What do the F_1 progeny of tall plants with round seeds and short plants with wrinkled seeds look like? (1 mark)
(b) Name the recessive traits in above case. (1 mark)
(c) Mention the type of the new combinations of plants obtained in F_2 progeny along with their ratio, if F_1 progeny was allowed to self pollinate. (2 marks)
(d) If 1600 plants were obtained in F_2 progeny, write the number of plants having traits:
(i) Tall with round seeds, (ii) Short with wrinkled seeds (1 mark)

36. (a) State Ohm's Law. Represent it mathematically. (1 mark)

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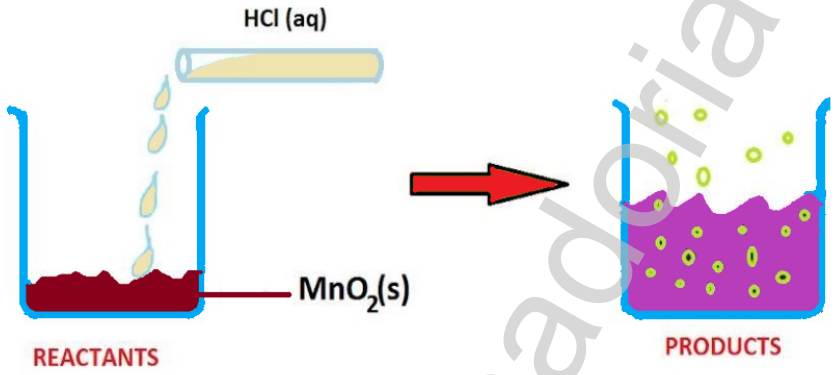
(b) Define 1 ohm. (1 mark)

(c) What is the resistance of a conductor through which a current of 1.5 A flows when a potential difference of 3 V is applied across its ends? (1 mark)

(d) The resistance of a wire of 0.01 cm radius is 10 Ω. If the resistivity of the wire is 50×10^{-8} Ωm, find the length of this wire. (2 marks)

Section E

37. The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities was released.



(i) The chemical reaction between MnO_2 and HCl is an example of:

(a) displacement reaction (b) combination reaction

(c) redox reaction (d) decomposition reaction.

(ii) Identify the correct statement from the following:

(a) MnO_2 is getting reduced whereas HCl is getting oxidized

(b) MnO_2 is getting oxidized whereas HCl is getting reduced.

(c) MnO_2 and HCl both are getting reduced.

(d) MnO_2 and HCl both are getting oxidized.

(iii) In the above discussed reaction, what is the nature of MnO_2?

(a) Acidic oxide (b) Basic oxide (c) Neutral oxide (d) Amphoteric oxide

(iv) What will happen if we take dry HCl gas instead of aqueous solution of HCl?

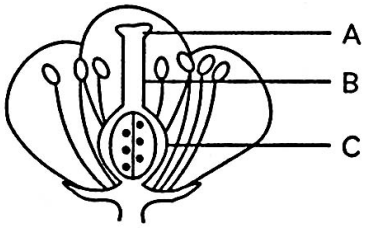
(a) Reaction will occur faster. (b) Reaction will not occur.

(c) Reaction rate will be slow (d) Reaction rate will remain the same.

38. Saloni visited Amrit Udyan (formerly called Mughal Garden) in New Delhi. She felt so happy and amazed to see different types of flowers having different colours and fragrances. She told her teacher that flowers beautify our environment and refreshes our mood and we should plant more and more flowering plants to enjoy this beauty.

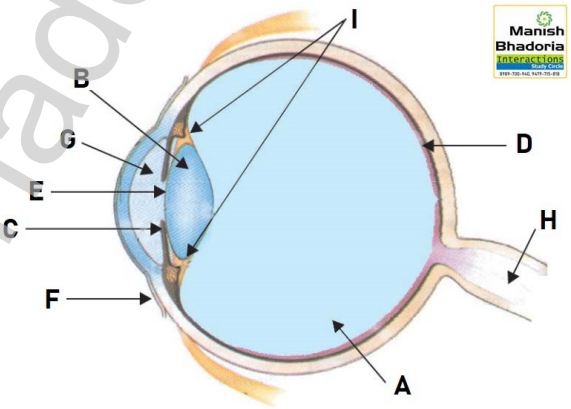
Her teacher told her that flowering plants are called angiosperms and they not only beautify

our surroundings, but also form an important part of our ecosystem.
(a) Where is the male and female gamete formed in flowering plant?
(b) Which part of the flower becomes seed after fertilization?
(c) Give one example of a unisexual flower.
(d) Identify the parts labelled as A, B and C. What do they constitute?



39. Human Eye is a remarkable organ. Our vision is a complex system with many intricate parts that all work together to produce a final product that almost everyone uses heavily on a daily basis. Despite the fact that we value our vision the most among all of our senses, surprisingly few people are aware of how our eyes function. When we look in the mirror, we can distinguish between the parts of the eye that are on the outside and those that are on the inside or farther away.

The given picture is of a human eye. Based on this diagram, answer the following questions:
(a) Name the part labelled as A and B in the figure given above.
(b) Which part of the eye is responsible for the colour of the eye?
(c) Identity and write the function of part 'D'.
(d) Name the part of the eye that controls the amount of light entering the eye.



Words of Wisdom

When we strive to become better than we are, everything around us becomes better too.

- Paolo Coelho

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