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PRE-BOARD EXAMINATION (2023-24)

CLASS-X

SUBJECT: SCIENCE (086)

SET 1

**Max.Marks:80**

**Time allowed: 3 hours**

**General Instructions:**

- i. This question paper consists of 39 questions in 5 sections.
- 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 consists of 20 objective type questions carrying 1 mark each.
- iv. Section B consists of 6 Very Short Answer questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words
- vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

**Section A**

**Multiple Choice Questions**

1. In the given reaction



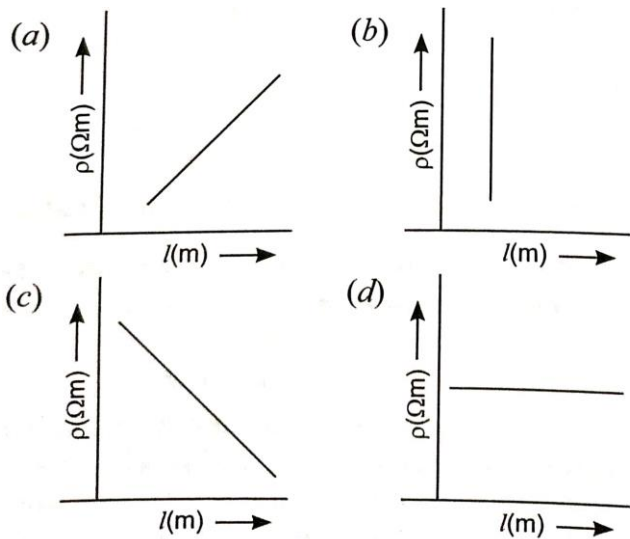
Identify the correct option which represents the substance oxidized and reducing agent

	Substance oxidized	Reducing agent
a.	Pb	PbO
b.	PbO	Pb
c.	C	C
d.	CO <sub>2</sub>	PbO

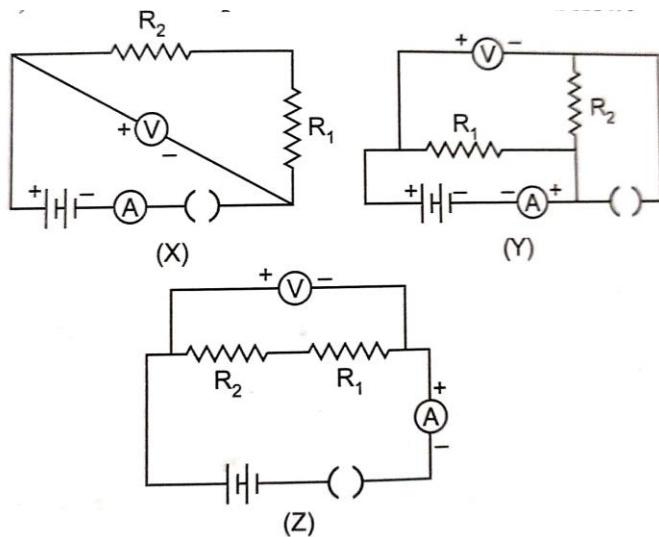
2. Reema took 5ml of lead nitrate solution in a beaker and added approximately 4ml of potassium iodide solution to it. What would she observe

- a. The solution turned red.
  - b. Yellow precipitate was formed.
  - c. White precipitate was formed.
  - d. The reaction mixture became hot.
3. Which of the following is an example of acidic salt:
- a.  $\text{ZnSO}_4$
  - b.  $\text{KNO}_3$
  - c.  $\text{KCl}$
  - d.  $\text{Na}_2\text{CO}_3$
4. Which of the following acids does not give hydrogen gas on reacting with metals (except Mn & Mg)
- a.  $\text{HNO}_3$
  - b.  $\text{HCl}$
  - c.  $\text{H}_2\text{SO}_4$
  - d. All of these
5. What is the common name of  $\text{CaOCl}_2$
- a. Bleaching Powder
  - b. Baking Soda
  - c. Washing Soda
  - d. Lime Water
6. Bronze is an alloy of
- a. Copper and zinc
  - b. Copper and lead
  - c. Copper and tin
  - d. Copper and nickel
7. Food cans are coated with tin and not with zinc because
- a. Zinc is costlier than tin.
  - b. Zinc has higher melting point than tin.
  - c. Zinc is more reactive than tin.
  - d. Zinc is less reactive than tin.
8. Which of the following pairs of organisms has a parasitic mode of nutrition?

- a. Lice and Tapeworm
  - b. Yeast and Leech
  - c. Mushroom and Tapeworm
  - d. Parakeet and Leech
9. Which of the following statements is correct about receptors?
- a. Gustatory receptors detect taste while olfactory receptors detect smell.
  - b. Both gustatory and olfactory receptors detect smell.
  - c. Auditory receptors detect smell and olfactory receptors detect taste.
  - d. Olfactory receptors detect taste and gustatory receptors smell.
10. Binary fission occurs in a definite orientation in which of the following
- a. Planaria
  - b. Amoeba
  - c. Leishmania
  - d. Hydra
11. A zygote which has an X-chromosome inherited from the father will develop into
- a. Boy
  - b. Girl
  - c. X-chromosome does not determine the sex of a child
  - d. Either girl or boy
12. .... Blood vessel carries oxygenated blood to the body while,,,,,,,,,,,,,, carries it from lungs to heart.
- a. Vena cava, Pulmonary artery
  - b. Vena cava ,Pulmonary vein
  - c. Aorta, Pulmonary artery
  - d. Aorta, Pulmonary vein
13. Raman wants to draw the graph to show how the resistivity of a wire changes with length of the wire. What would his graph look like?



14. For determining equivalent resistance of two resistors  $R_1$  and  $R_2$  connected in series, three students X, Y and Z set up their circuits as shown below. The correct set up is that of:



- Student X only.
- Student Y only.
- Student Z only.
- Student X and Z.

15. Accumulation of Non Biodegradable pesticides in the food chain in increasing amount at each higher trophic level is known as

- Eutrophication
- Pollution
- Biomagnification
- All of these

16. Which of the following limits the number of trophic levels in a food chain?
- Decrease in energy at Higher trophic levels
  - Deficient Food supply
  - Polluted air
  - Water

### Assertion-Reason Type

In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- Assertion (A) is true but reason (R) is false.
- Assertion (A) is false but reason (R) is true.

17. Assertion: Heat is required for the decomposition of lead nitrate.

Reason: Decomposition reactions are endothermic.

18. Assertion: In humans, males play an important role in determining the sex of the child.

Reason: Males have two X chromosomes.

19. Assertion: On freely suspending a current carrying solenoid, it comes to rest in N – S direction just like a bar magnet.

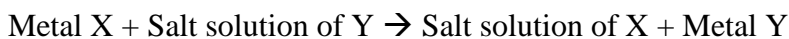
Reason: One end of current carrying solenoid behaves as a North pole and the other end as a South pole.

20. Assertion: A food chain represents a unidirectional transfer of energy.

Reason: Food chains help us in understanding various interactions among the different organisms and also their interdependence.

### Section B

21. When metal X is added to salt solution of a metal Y, following chemical reaction takes place:



Mention the type of reaction and the reactivity of metal X and metal Y.

22. Rajesh observed a patch of greenish black powdery mass on a stale piece of bread

- Name the organism responsible for this and specific mode of asexual reproduction.
- Name its vegetative and reproductive parts.

23. What is the function of trachea? Why do the walls not collapse even when there is less air in it?

**OR**

Pancreas acts both as endocrine and exocrine gland. Justify giving reasons.

24. a) Why do planets not twinkle?  
b) What is the cause of formation of rainbow?
25. How can we combine the components of white light after a prism has separated them? Draw a diagram to support.

**OR**

Draw a ray diagram to show the refraction of light through a glass prism ignoring dispersion. Mark on it (a) incident ray (b) emergent ray and (c) the angle of deviation.

26. a. From the following group of organisms create a food chain which is most advantageous for human beings in terms of energy.  
Hawk, rat, Cereal plant, goat, snake, human being  
b. Construct a food web using the organisms mentioned above.

### **Section C**

27. A small amount of quicklime is added to water in a beaker.
- Name and define the type of reaction that has taken place.
  - Write balanced chemical equation for the above reaction. Write the chemical name of product obtained.
  - State two observations that you will make in the reaction.
28. a. Write electron dot structure for sodium and oxygen.  
b. Show the formation  $\text{Na}_2\text{O}$  by electron transfer.

**OR**

What happens when (give reactions only)

- Zinc reacts with copper sulphate solution.
  - Aluminium reacts with steam.
  - Sodium reacts with water
29. Why is chemical communication better than electrical impulses as a means of communication between cells of a multicellular organism?
30. How do Mendel's experiments show that traits may be dominant or recessive?
31. a) A thin convex lens of power 4D is combined with a thin concave lens of power 2D. What is the power and nature of the combination of lenses?  
b) If the refractive index of glass for light entering from air to glass is  $\frac{3}{2}$ , find the refractive index of light going from glass to air.

c) Define the term principal axis of a spherical mirror.

32. a) State whether an alpha particle (positively charged) will experience any force in a magnetic field if -
- it is placed at rest.
  - it moves parallel to the field lines.
  - it moves perpendicular to the field lines.
- b) Think 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 strong magnetic field to your right side. What is the direction of magnetic field?
33. The linear magnification produced by a spherical mirror is +3.  
Analyse this value and state the a) type of mirror. b) nature of the image formed. c) position of the object with respect to the pole.  
Draw a diagram to show the formation of image in this case.

### Section D

34. 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.

**OR**

An organic compound A, on heating with concentrated  $H_2SO_4$ , forms a compound B which on addition of one mole of hydrogen in presence of Ni forms a compound C. One mole of compound C, on combustion forms 2 moles of  $CO_2$  and 3 moles of  $H_2O$ . Identify the compounds A, B and C. Write the chemical equations of the reactions involved.

35. a) Describe the role of prostate gland seminal vesicles and testis in the human male reproductive system.  
b) How is surgical removal of unwanted pregnancy is misused?  
c) Explain the role of oral contraceptive pills in preventing conception.

**OR**

How is the movement of leaves of the sensitive plant different from the movement of a shoot towards light?

36. a) What is a solenoid?  
b) What is the pattern of magnetic field lines inside a solenoid? What do they indicate?  
c) State the two ways by which the strength of an electromagnet can be increased.

**OR**

- a) Draw the magnetic field lines through and around a single loop of wire carrying electric current.
- b) How will the magnetic field produced in a current carrying circular coil change if we -
  - i) increase the value of current?
  - ii) increase the distance from the coil?
  - iii) increase the number of turns in the coil?

### **Section E**

Read the following passage and answer the questions

37. Ionic compounds are solid and hard. These are brittle and break into pieces when pressure is applied. These compounds have high melting and boiling points. These are soluble in water and insoluble in organic solvents such as kerosene, petrol. These conduct electricity in molten state but not in solid state.

- a. Name the ions present in sodium oxide compounds.
- b. What are ionic compounds?

**OR**

- b) Why are ionic compounds hard and solid?
- c) Are ionic compounds soluble in water?
- d) At what state do ionic compounds conduct electricity?

38. All human chromosomes are not paired. Most human chromosomes have a maternal and paternal copy 22 such pairs. But One pair called the sex chromosomes is odd in not always being a perfect pair. Women have a perfect pair of sex chromosomes. But men have a mismatched pair in which one is normal sized while the other is a short one.

- a. In human how many chromosomes are present in a zygote and each gamete?
- b. A few reptiles rely entirely on Environment quiz for sex determination. Comment.
- c. "The sex of a child is a matter of chance and none of the parents are considered to be responsible for it" justify it through flowchart only.

**OR**

- c) Why do all the gametes formed in human females have an X chromosome?

39. The ability of a medium to refract light is expressed in terms of optical density. It is not the same as mass density. It actually means optically rarer medium and optically denser medium respectively. In comparing two media, the one with larger refractive index is optically denser medium than the other. The other medium of lower refractive index is optically rarer. The speed of light is higher in a rarer medium than in a denser medium.

- a. What happens to the speed of light when light travels from a rarer to denser medium?



- b. How is optical density of a medium related to the refractive index of the medium?
- c. Compare the mass density and optical density of kerosene and water.

**OR**

- c) State the laws of refraction of light.