



# COMMON PRE-BOARD EXAMINATION 2022-23

## SCIENCE - 086



Class: X  
Date: 19/01/2023

Max. Marks: 80  
Max. Time: 3 Hours

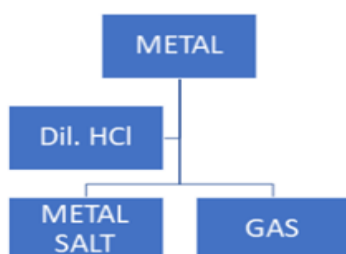
### General Instructions:

- (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 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. Answers 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

Select and write one most appropriate option out of the four options given for each of the questions 1 - 20

1



1

Which of the following two combinations are correct?

	Metal	Gas evolved
(i)	Copper	Yes
(ii)	Iron	Yes
(iii)	Magnesium	No
(iv)	Zinc	Yes

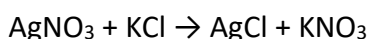
- (a) i and iii
- (b) i and iv
- (c) ii and iii
- (d) ii and iv

- 2 In the reaction of iron with copper sulphate solution:  $\text{CuSO}_4 + \text{Fe} \rightarrow \text{Cu} + \text{FeSO}_4$  1  
Which option in the given table correctly represents the substance oxidised and the reducing agent?

OPTION	Substance Oxidized	Reducing Agent
A	Fe	Fe
B	Fe	$\text{FeSO}_4$
C	Cu	Fe
D	$\text{CuSO}_4$	Fe

- (a) Option A
- (b) Option B
- (c) Option C
- (d) Option D

- 3 The chemical reaction between potassium chloride and silver nitrate is given by the chemical equation. 1



What can be inferred from the chemical equation?

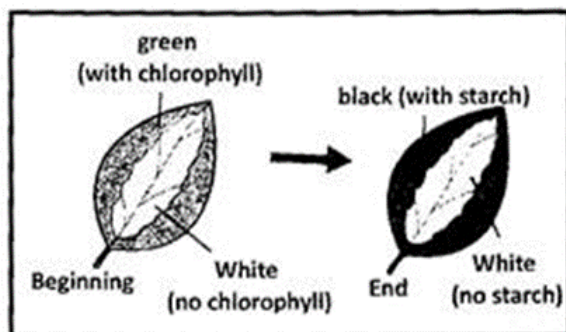
- (a) silver nitrate and potassium chloride undergo a decomposition reaction to form silver chloride and potassium nitrate
- (b) silver nitrate and potassium chloride undergo a displacement reaction to form silver chloride and potassium nitrate
- (c) silver nitrate and potassium chloride undergo a combination reaction to form silver chloride and potassium nitrate
- (d) silver nitrate and potassium chloride undergo double displacement reaction to form silver chloride and potassium nitrate

- 4 A student while heating solid lead nitrate taken in a test tube would observe 1

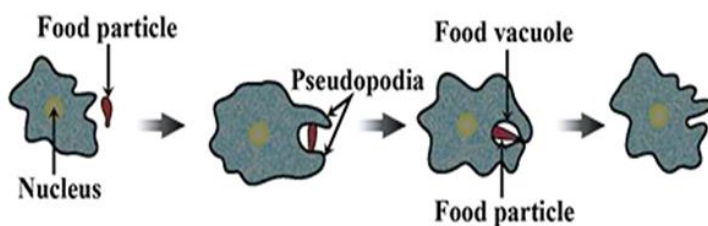
- (a) yellow residue of  $\text{PbO}$
- (b) green residue of  $\text{NO}_2$
- (c) brown residue of  $\text{NO}$

(d) white residue of  $\text{PbO}_2$

- 5 Which is the most reactive metal in the reactivity series? 1
- (a) Sodium
  - (b) Potassium
  - (c) Iron
  - (d) Calcium
- 6 Which of the following gives the correct increasing order of acidic strength? 1
- (a) Water < Acetic acid < Hydrochloric acid
  - (b) Water < Hydrochloric acid < Acetic acid
  - (c) Acetic acid < Water < Hydrochloric acid
  - (d) Hydrochloric acid < Water < Acetic acid
- 7 Pentane has the molecular formula  $\text{C}_5\text{H}_{12}$ . It has 1
- (a) 5 covalent bonds
  - (b) 12 covalent bonds
  - (c) 16 covalent bonds
  - (d) 17 covalent bonds
- 8 What is the aim of the given experiment? 1



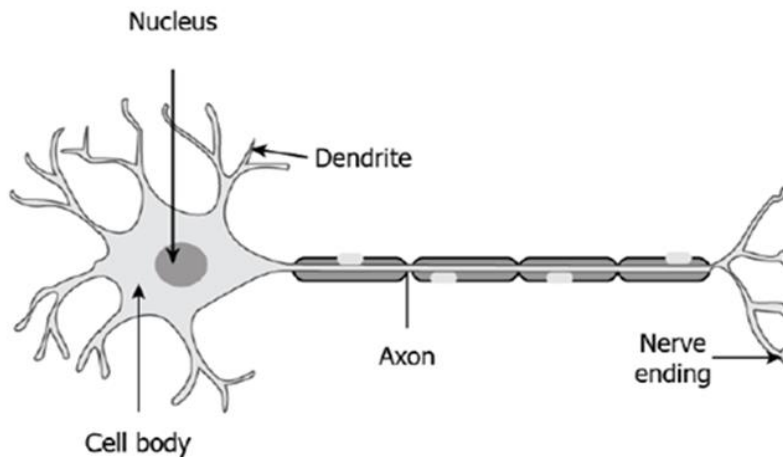
- (a) To show that chlorophyll is necessary for photosynthesis
  - (b) To show that sunlight is necessary for photosynthesis.
  - (c) To show that oxygen is released as a result of photosynthesis
  - (d) To show that leaves can be double coloured.
- 9 Identify the type of nutrition exhibited by the given figure. 1



- (a) Parasitic nutrition
- (b) Saprophytic nutrition
- (c) Holozoic nutrition
- (d) Symbiotic nutrition

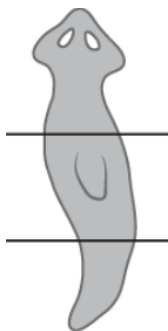
- 10 A Yellow and Round seeded pea plant has genotype YyRr. The gametes produced shall be 1
- (a) Yy, Rr, rr
  - (b) YR, yR, Yr, yr
  - (c) YR, yr
  - (d) Y, y, R, r

- 11 The image shows the structure of a neuron. 1



After our nose senses a smell, which option shows the mechanism of the travelling of sense in our body?

- (a) olfactory receptors → dendritic tip of a nerve cell → axon → nerve ending → release of signal dendritic tip of other nerve cell
  - (b) olfactory receptors → dendritic tip of a nerve cell → axon → cell body → release of signal → dendritic tip of other nerve cell
  - (c) gustatory receptors → dendritic tip of a nerve cell → cell body → axon → release of signal dendritic tip of other nerve cell
  - (d) gustatory receptors → dendritic tip of a nerve cell → axon → cell body → release of signal dendritic tip of other nerve cell
- 12 A student takes a planaria in the lab and cuts into three parts as shown. 1

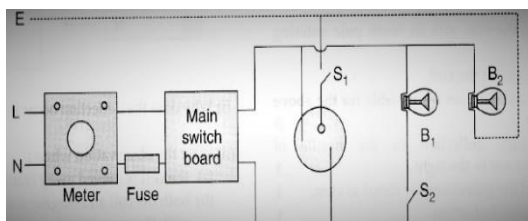


What will likely happen?

- (a) the cells around the cut start to divide to form lost part
- (b) the cells around the cut enlarge to take the shape of lost part
- (c) the cells around the cut start to divide to form a complete organism
- (d) the cells around the cut attracts other planarians to fuse with the separated part

- 13 If the length of a conductor and its radius is increased twice, how the resistance will change? 1
- Resistance will remain unchanged.
  - Resistance will increase twice.
  - Resistance will become half.
  - Resistance will increase 4 times.

- 14 Mention the colour convention for live, neutral and earth wire respectively. 1



- Red, green, Black
  - Black, green, red
  - Red, black, green
  - Green, black, red
- 15 A component used to regulate current without changing the voltage source is called as 1
- Resistance
  - Electric current
  - Potential difference
  - Variable resistance
- 16 A student inserts a bar magnet in the coil. The student observes deflection in the galvanometer connected to the coil. What will happen if the magnet is continuously getting in and out of the coil? 1
- the current induced in the coil will increase.
  - the current will change its direction continuously.
  - the magnetic field will create a motion in the coil.
  - the magnetic field of the bar magnet would keep decreasing.

**Q. No 17 – 20 are Assertion – Reasoning based questions.**

**These consist of two statements – Assertion(A) and Reason (R). Answer these questions selecting the appropriate option given below:**

- Both A and R are true, and R is correct explanation of the A**
  - Both A and R are true, but R is not the correct explanation of A**
  - A is true, but R is false.**
  - A is false, but R is true.**
- 17 **Assertion:** Decomposition of vegetable matter into compost is an example of exothermic reactions. 1
- Reason:** Exothermic reaction are those reactions in which heat is evolved.

- 18 **Assertion:** Chromosomes are known as hereditary vehicles. 1  
**Reason:** The chromosomes are capable of self- reproduction and maintaining morphological and physiological properties through successive generations.
- 19 **Assertion:** Clones are offspring of an organism formed by asexual reproduction. 1  
**Reason:** Clones have exact copies of DNA as their parent.
- 20 **Assertion:** The magnetic field intensity at the center of a circular coil carrying current changes, if the current through the coil is doubled. 1  
**Reason:** The magnetic field intensity is dependent on current in the conductor.

### SECTION – B

#### Q. No 21 to 26 are very short answer questions

- 21 When zinc metal is treated with a dilute solution of a strong acid, a gas is evolved, which is utilized in the hydrogenation of oil. Name the gas evolved. Write the chemical equation of the reaction and also write a test to detect the gas formed. 2

**OR**

- (a) Write the formula and chemical name of bleaching powder.  
 (b) Write the chemical equation to represent the action of atmospheric CO<sub>2</sub> gas on bleaching powder when left exposed in open.
- 22 Why is pancreas called a " dual function" gland? Write the names of its hormones? 2
- 23 If villi are absent in the small intestine, what will happen? 2
- 24 What is dialysis? Under what conditions is it carried out? 2
- 25 What is dispersion of white light? Draw a diagram to show the dispersion of white light by a glass prism. 2

**OR**

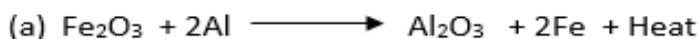
The Sun is visible to us about 2 minutes before the actual sunrise. Explain.

- 26 What are decomposers? What will be the consequence of their absence in an ecosystem? 2

### SECTION – C

#### Q. No 27 to 33 are short answer questions

- 27 Identify the type of each of the following reactions stating reason for your answers: 3



- 28 (a) Classify the following salt as acidic, basic or neutral: 3  
(i) NaCl (ii) Na<sub>2</sub>SO<sub>4</sub> (iii) CaCl<sub>2</sub> (iv) K<sub>2</sub>CO<sub>3</sub>  
(b) A compound is formed due to the recrystallisation of sodium carbonate. Identify the compound and write its chemical formula.

- 29 "Blood circulation in fishes is different from the blood circulation in human beings". Justify the statement. 3

**OR**

Describe an experiment to show that water is lost from the stomata of leaf.

- 30 Define the term linear magnification with reference to spherical mirrors. If a concave mirror forms a real image 40cm from the mirror, when the object is placed at a distance of 20cm from its pole, find the focal length and magnification. 3

- 31 (a) List two causes of hypermetropia. 3  
(b) Draw ray diagrams showing a hypermetropic eye and its correction using suitable optical device.

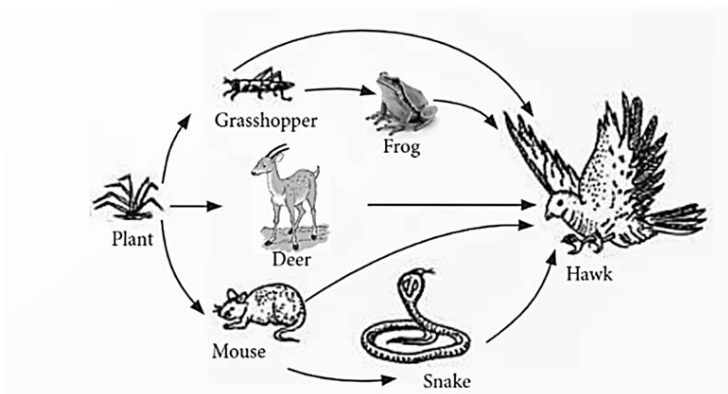
- 32 A compass needle is placed near a current carrying straight conductor. State your observation for the following cases and give reasons for the same in each case. 3  
(a) Magnitude of electric current is increased.  
(b) The compass needle is displaced away from the conductor.

**OR**

We know a current carrying conductor placed in a magnetic field experiences a force due to which the conductor moves. How do we think the rod displaces if-?

- (a) current in rod is increased  
(b) a stronger horse shoe is inserted  
(c) length of the rod is increased.

- 33 Study the given food web through which energy passes in the ecosystem. 3



- (a) How many food chains are shown in the given figure?  
(b) Write down two characteristics of the interaction shown in the figure.

**SECTION – D**

**Q. No 34 to 36 are Long answer questions**

- 34 (a) What happens when: 5  
(Write chemical equation in each case)  
(i) Ethanol is burnt in air?  
(ii) Ethanol is heated with excess conc.  $H_2SO_4$  at 443K?  
(iii) A piece of sodium is dropped in ethanol?  
(b) Name two oxidizing agents that are used to convert alcohol to acids. Distinguish between ethanol and ethanoic acid on the basis of litmus test.
- 35 (a) In a germinating seed, which parts are known as future shoot and future root? Mention the 5  
function of cotyledon.  
(b) Write one main difference between asexual and sexual mode of reproduction. Which species is likely to have comparatively better chances of survival the one reproducing asexually or the one reproducing sexually? Justify your answer.

**OR**

- (a) Is the chromosome number of the zygote, embryonal cells and adult of a particular organism always constant? How is the constancy maintained in these three stages?  
(b) What changes are observed in the uterus if fertilization does not occur?
- 36 (a) What is a solenoid? Draw the magnetic field lines for a current carrying solenoid. 5  
(b) How will you convert a solenoid into an electromagnet? What are the factors that decide the strength of the electromagnet?

**SECTION – D**

**Q. no 37 to 39 are case - based / data – based questions with 2 to 3 short sub – parts. Internal choice is provided in one of these sub – parts.**

- 37 Silver articles become black after some time when exposed to air. This is because it reacts with 4  
sulphur in the air to form a coating of silver sulphide.  
Copper reacts with moist carbon dioxide in the air and slowly loses its shiny brown surface and gains a green coat. This green substance is copper carbonate.  
Iron when exposed to moist air for a long time acquires a coating of a brown flaky substance

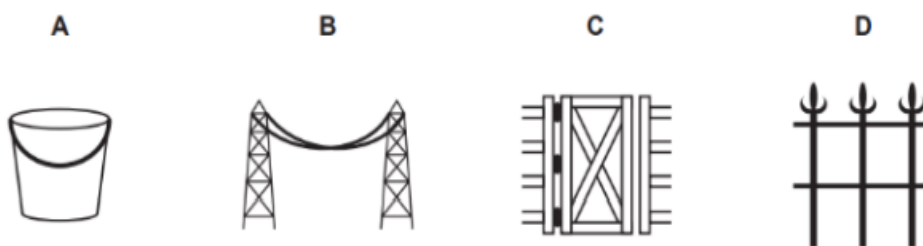


called rust. Coating a thin layer of zinc over steel and iron will protect it from rusting. Alloying is a very good method of improving the properties of a metal. Let us find out the conditions under which iron rusts.

- (a) Write a chemical equation for rusting of iron.
- (b) Why corrosion of iron is a serious problem?
- (c) Name the process by which zinc is coated over iron articles to prevent from rusting. Also give any two other methods to prevent rusting.

**OR**

- (d) In which of the following applications of Iron, rusting will occur most? Support your answer with valid reason.



- A - Iron Bucket electroplated with Zinc
- B - Electricity cables having iron wires covered with aluminium
- C - Iron hinges on a gate
- D - Painted iron fence

- 38 Inheritance rules are based on the fact that both the father and the mother equally contribute genetic material to their child, which means every characteristic that is inherited is influenced by the paternal and maternal DNA. Hence, for each trait, there are two versions in each child, one from the father and the other from the mother. Gregor Mendel formulated rules for inheritance after thorough understanding and experimentation. 4

Mendel experimented using many physical characters of garden peas such as round/wrinkled seeds, white/violet flowers, tall/short plants etc.

- (a) Mention any two recessive traits of a garden pea.
- (b) What was the genotypic ratio of monohybrid cross?
- (c) Why is the F<sub>1</sub> progeny always of tall plants when a tall plant is crossed with a short pea plant?

**OR**

- (d) A cross was made between pure breeding pea plants, one with round and green seeds and the other with wrinkled and yellow seeds.

Write the phenotype of F<sub>1</sub> progeny. Give reason for your answer.

- 39 The absolute refractive index of a medium is simply called its refractive index. The refractive index of several media is given in Table given below. From the Table you can know that the refractive index of water,  $n_w = 1.33$ . This means that the ratio of the speed of light in air and the speed of light in water is equal to 1.33. Similarly, the refractive index of crown glass,  $n_g = 1.52$ . 4

Material medium	Refractive index	Material medium	Refractive index
Air	1.0003	Canada Balsam	1.53
Ice	1.31	-	-
Water	1.33	Rock salt	1.54
Alcohol	1.36	-	-
Kerosene	1.44	Carbon disulphide	1.63
Fused quartz	1.46	Dense flint glass	1.65
Turpentine oil	1.47	Ruby	1.71
Benzene	1.50	Sapphire	1.77
Crown glass	1.52	Diamond	2.42

- (a) Write down the formula used to find out the absolute refractive index of a medium.
- (b) Find out the speed of light in benzene. (speed of light in air =  $3 \times 10^8$  m/s)
- (c) Find out the medium with lowest refractive index and medium with highest refractive index by using the data given above. Also mention the refractive index of the corresponding media.

**OR**

- (d) (i) Write two pairs of media which is optically denser than the other, but massively rarer.
- (ii) How is the speed of light and the refractive index of the medium related?