

**Meghalaya Board
Class X
Science and Technology
Sample Paper 1**

Time allowed: 3 hours**Maximum Marks: 80****General Instructions:**

1. Write all the answers in the Answer Script.
2. Attempt all parts of a Group serially in one place.
3. The figures in the margin indicate full marks for the questions.
4. This question paper comprises of three sections A, B and C.
5. The candidates are advised to attempt all the questions of sections A, B and C separately.
6. Marks allocated to every question are indicated against it.

SECTION- A**(PHYSICS)****(Marks- 26)**

Answer the following very short answer type questions in one sentence each: **1 X 4=4**

- 1) What do you mean by a focal point of a mirror? **1**
- 2) Why does the sky appear dark instead of blue to an astronaut? **1**
- 3) In a circuit if two resistors of $5\ \Omega$ and $10\ \Omega$ are connected in series, compare the current passing through the two resistors. **1**
- 4) Whenever there is a relative motion between a magnet and a coil, a current is induced in the coil. Name this phenomenon. **1**

Answer the following very short answer type questions in 20-30 words each:

2 X 4=8

- 5) An electric heater is used on a 220-V supply and it consumes a current of 3.4 A. Calculate: (i) its power and (ii) its resistance when it is in use **2**
- 6) Write the principle of the windmill. **2**
- 7) Does refraction take place in the atmosphere? Give reason. **2**
- 8) A pool of water appears to be less deep than it actually is. Why? **2**

Answer the following short answer type questions in 30-40 words each:

3 X 3=9

- 9)** How can a magnetic field be produced without using a magnet? Describe an experiment to show that a magnetic field exerts a force on a current-carrying conductor. **3**
- 10)** Define the term dispersion of white light. Name the colour of light which bends (i) the most, (ii) the least, while passing through a glass prism. Draw a ray diagram to justify your answer **3**
- 11)** The image of an object placed at 60 cm in front of a lens is obtained on a screen at a distance of 120 cm from it. Find the focal length of the lens. What would be the height of the image if the object is 5 cm high? **3**

Or

A convex mirror used on a bus has a focal length of 200 cm. If a scooter is located at 400 cm from this mirror, find the position, nature and magnification of the image formed in the mirror.

Answer the following long answer type question in 50-60 words each: **5**

- 12)** What is meant by power of a lens? Name and define its SI unit.
One student uses a lens of focal length +50 cm and another of –50 cm. State the nature of each lens and find their powers. Which of the two lenses will always give a virtual, erect and diminished image irrespective of the position of the object?

(3+2)=5

Or

- (a) List the factors on which the resistance of a conductor depends.
(b) A 4-kW heater is connected to a 220-V power source. Calculate
(i) The electric current passing through the heater.
(ii) The resistance of the heater.
(iii) The electric energy consumed in a 2-hour use of the heater.

SECTION -B
(CHEMISTRY)
(Marks-26)

Answer the following very short answer type questions in one sentence each: **1 X 3=3**

13) Give an example of a double displacement reaction not involving the formation of a precipitate (only balanced equation of the reaction). **1**

14) Why is carbon not used for reducing aluminium from aluminium oxide? **1**

15) Name the following compound according to IUPAC: $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ **1**

Answer the following very short answer type questions in 20-30 words each:

2 X 3=6

16) What are groups and periods in the periodic table? Two elements X and Y belong to Groups 1 and 2, respectively, and are in the same period of the periodic table. How do the following properties of X and Y vary? **2**

(a) Their valencies in forming oxides

(b) Molecular formula of their chlorides

2

17) What is the reaction which takes place when baking soda is heated for cooking? Give the use of carbon dioxide produced in this reaction. **2**

18) State the constituents of solder and their percentage composition. Which property of solder makes it suitable for welding electrical wires? **2**

Answer the following short answer type questions in 30-40 words each:

3 X 4=12

19) **3**

(a) How is plaster of Paris chemically different from gypsum? How may they be interconverted? Write one use of plaster of Paris.

(b) State the relation between hydrogen ion concentration of an aqueous solution and its pH. Provide the formula to show the relation between hydrogen ion concentration and pH.

20) Give reasons for the following: **3**

(a) Oxidation of ethanol with CrO_3 produces ethanal, while ethanol when oxidised with alkaline KMnO_4 produces ethanoic acid.

(b) Propanone forms addition product with HCN .

(c) Alcohol supplied for industrial purposes is mixed with copper sulphate.

- 21)** Ethanol is used on a large scale at commercial level. It is commonly called alcohol and is the active ingredient of alcoholic drink. But, consumption of alcohol also causes drunkenness and this practice is socially condemned. As a responsible student of class X, what steps you would take to discourage the use of alcohol? **3**

Or

Classify following into alkanes, alkenes and alkynes: CH_4 , C_2H_2 , C_4H_6 , C_2H_4 , C_3H_6 , C_2H_6 , C_3H_8 , C_3H_4 . Give reasons.

- 22)** No chemical reaction takes place when granules of a solid A are mixed with the powder of another solid B. However, when the mixture is heated, a reaction takes place between its components. One of the products, C, is a metal and settles in the molten state, while the other product D floats over it. It was observed that the reaction is highly exothermic.

Based on the given information, make an assumption about A and B and write a chemical equation for the chemical reaction indicating the conditions of reaction, physical state of reactants and products and thermal states of the reaction. Mention any two types of reactions under which the above chemical reaction can be classified. **3**

Answer the following long answer type question in 50-60 words each: **5**

- 23)** Give reason why

- (i) Metals are good conductors, whereas non-metals are bad conductors of electricity.
- (ii) Metals replace hydrogen from acids, whereas non-metals do not.
- (iii) An iron knife dipped in a blue copper sulphate solution turns the blue solution light green.
- (iv) Sodium is kept under kerosene.
- (v) Carbon cannot reduce the oxides of sodium or aluminium.

Or

Which physical and chemical properties of the elements were used by Mendeleev in creating his periodic table? List two observations which posed a challenge to Mendeleev's periodic table.

**SECTION -C
(BIOLOGY)
(Marks-28)**

Answer the following very short answer type questions in one sentence each: **1 X 4=4**

- 24)** What is the basic difference between asexual reproduction and sexual reproduction? **1**
- 25)** Name the process in which a harmful chemical enters the food chain and gets concentrated at each trophic level. **1**
- 26)** What happens to the plant cell when we keep it in the hypotonic solution? **1**
- 27)** What acts as a receptor in humans? **1**

Answer the following very short answer type questions in 20-30 words each:

2 X 5=10

- 28)** Why do fish die when taken out of water? **2**
- 29)** Which gland secretes the adrenaline hormone? Write its importance in our body. **2**
- 30)** How can it be said that birds are closely related to reptiles? **2**
- 31)** Why the female reproductive system is more complex than that of male reproductive system? **2**
- 32)** What is excretion? How do unicellular organisms remove their wastes? **2**

Answer the following short answer type questions in 30-40 words each:

3 X 3=9

- 33)** Give reasons for the following: **3**
- (a) The glottis is guarded by the epiglottis.
 - (b) Lung alveoli are covered with blood capillaries.
 - (c) The tracheal wall is supported by cartilaginous rings
- 34)** Why is the rate of breathing much faster in aquatic organisms than in terrestrial organisms? **3**

35) The genotype of green stemmed tomato plants is denoted as GG and that of purple stemmed tomato plants is denoted as gg. When these two are crossed with each other: 3

(a) What colour of stem would you expect in the F1 progeny?

(b) Give the percentage of purple stemmed plants if F1 plants are self-pollinated. **3**

Or

We hear and read about female foeticide which is really a wrong practice. In some families, be it rural or urban, females are tortured for giving birth to a girl child. They do not seem to understand the scientific reason behind the birth of a boy or a girl. In your opinion, the approach of society towards the mother in this regard is correct or not? Explain the scientific reason.

Answer the following long answer type question in 50-60 words each: 5

36)

(a) Give three advantages of rain-harvested water stored underground.

(b) Forests cannot be conserved only by legislation; local human intervention is also required'. Justify your answer with two examples.