

**CLASS X (2020-21)**  
**SCIENCE (CODE 086)**  
**SAMPLE PAPER-1**

**Time : 3 Hours**

**Maximum Marks : 80**

**General Instructions :**

- (i) The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
  - (ii) Section–A – question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
  - (iii) Section–B – question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.
  - (iv) Section–C – question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.
  - (v) Section–D – question no. 34 to 36 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
  - (vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
  - (vii) Wherever necessary, neat and properly labeled diagrams should be drawn.
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**SECTION A**

Q1. Name a device that helps to maintain a potential difference across a conductor. [1]

**OR**

Which metal has lowest resistivity?

Q2. What change in colour is observed when white silver chloride is left exposed to sunlight? What type of chemical reaction is this? [1]

Q3. If the charge on an electron be  $1.6 \times 10^{-19}C$ , find the approximate number of electrons in 1 C. [1]

Q4. When is potential difference between two points said to be 1 volt? [1]

Q5. Name two specialised tissues that provide control and coordination in multicellular organisms. [1]

Q6. Name the method by which Spirogyra reproduce under favourable conditions. Is this method sexual or asexual? [1]

**OR**

When a cell reproduces, what happens to its DNA?

Q7. What can be seen when a strip of copper metal is placed in a solution of silver nitrate? [1]

Q8. Hydrogen being a highly inflammable gas and oxygen being a supporter of combustion, yet water a compound made up of hydrogen and oxygen is used to extinguish fire. Why? [1]

Q9. What is meant by water of crystallisation in a substance? [1]

**OR**

What effect does an increase in concentration of  $H^+(aq)$  ions in a solution have on pH of solution?

Q10. At what pH in the mouth is tooth decay faster and why? [1]

Q11. Name any one metal which reacts neither with cold water nor with hot water but reacts with heated steam to produce hydrogen gas. [1]

**OR**

Name one metal and one non-metal in liquid state at room temperature.

Q12. Mendel observed a contrasting trait in relation to position of flowers. Mention the trait. [1]

**OR**

What is heredity?

Q13. Name the sensory receptors found in the nose and on the tongue. [1]

**For question numbers 14, 15 and 16, two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below :**

(a) Both A and R are true and R is correct explanation of the assertion.

(b) Both A and R are true but R is not the correct explanation of the assertion.

(c) A is true but R is false.

(d) A is false but R is true.

Q14. **Assertion :** Respiration in living beings is called exothermic reaction. [1]

**Reason :** Respiration in living beings involves with absorption of heat energy.

Q15. **Assertion :** Copper is used to make hot water tanks and not steel. [1]

**Reason :** Copper is a better conductor of heat than steel and it is fairly resistant to corrosion than steel.

**OR**

**Assertion :** When zinc is added to a solution of iron (II) sulphate, no change is observed.

**Reason :** Zinc is less reactive than iron.

Q16. **Assertion :** During fertilization only head of spermatozoa enters egg. [1]

**Reason :** If several spermatozoa hit the egg at same time, all can enter the egg.

Q17. **Read the following and answer any four questions from 17.1 to 17.5.** 1 × 4

Energy is needed to maintain a state of order in our body. The source of energy and materials is the food we eat. Some organisms use simple food material obtained from inorganic sources and other organisms utilise complex substances. These complex substances have to be broken down into simpler ones before they can be used for the upkeep and growth of the body.

**17.1** All non-green organisms fall under the category of

(a) autotrophs

(b) heterotrophs

(c) saprobes

(d) chemotrophs

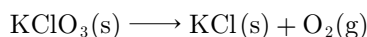


17.5 Study the table below and select the row that has the incorrect information.

	Organism	Type of heterotrophic nutrition
(a)	Amoeba	Holozoic
(b)	Mushroom	Saprophytic
(c)	Lice	Parasitic
(d)	Lion	Parasitic

Q18. Read the following and answer any four questions from 18.1 to 18.5. 1 × 4

Oxygen is prepared by catalytic decomposition of potassium chlorate ( $\text{KClO}_3$ ). Decomposition of potassium chlorate gives potassium chloride ( $\text{KCl}$ ) and oxygen ( $\text{O}_2$ ). The following reaction takes place :



18.1 How many moles of  $\text{KClO}_3$  are required to produce 2.4 moles of  $\text{O}_2$ ?

- (a) 1.6 mole (b) 2.6 moles  
(c) 2.1 mole (d) 1.9 moles

18.2 Which element is reduced in the given reaction.

- (a) oxygen (b) potassium  
(c) chlorine (d) None the these

18.3 How many moles of  $\text{KClO}_3$  give 3 moles of oxygen?

- (a) 2 mole (b) 1 moles  
(c) 4 mole (d) 5 moles

18.4 The oxidation state of chlorine in potassium chlorate is

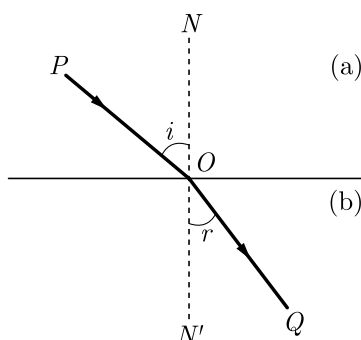
- (a) +2 (b) +3  
(c) +4 (d) +5

18.5 Decomposition of potassium chlorate gives

- (a)  $\text{KCl}$  (b)  $\text{O}_2$   
(c)  $\text{KCl}, \text{O}_2$  (d)  $\text{KCl}_3$

Q19. Read the following and answer any four questions from 19.1 to 19.5. 1 × 4

Sunita wants to observed the phenomenon of refraction of light when she performed the experiment of refraction of light. She observed that When light ray goes from one transparent medium to another transparent medium, it suffers a change in direction, into second medium. The extent of the change in direction suffered by the phenomenon of change in the path of light rays when going from one medium to another medium is known as refraction. Ray is a given pair of media can be expressed in terms of refractive index. The refractive index is related to an important physical quantity in the relative speed of light in different media.

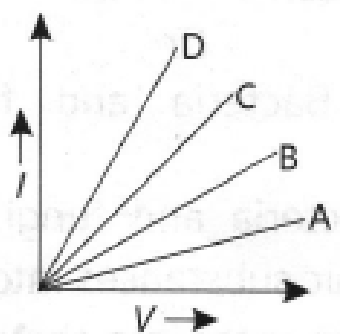


- 19.1** When light goes from one medium to another than which parameter of light wave remain constant?  
 (a) Frequency (b) Wavelength  
 (c) Velocity (d) Amplitude
- 19.2** Refractive indices of water, sulphuric acid, glass and carbon disulphide are 1.33, 1.43, 1.53 and 1.63 respectively. The light travels slowest in  
 (a) sulphuric acid (b) glass  
 (c) water (d) carbon disulphide
- 19.3** Light enters from air to glass having refractive index 1.50. The speed of light in vacuum is  $3 \times 10^8 \text{ ms}^{-1}$  the speed of light in the glass is?  
 (a)  $2 \times 10^8 \text{ ms}^{-1}$  (b)  $3 \times 10^9 \text{ ms}^{-1}$   
 (c)  $4 \times 10^8 \text{ ms}^{-1}$  (d)  $2.5 \times 10^8 \text{ ms}^{-1}$
- 19.4** The unit of refractive index?  
 (a) m/s (b)  $\text{m}^2/\text{s}$   
 (c) Unit less (d)  $\text{m} - \text{s}$
- 19.5** A ray of light passes from a medium *A* to another medium *B*. No bending of light occurs if the ray of light hits the boundary of medium *B* at an angle of  
 (a)  $0^\circ$  (b)  $45^\circ$   
 (c)  $90^\circ$  (d)  $120^\circ$

**Q20. Read the following and answer any four questions from 20.1 to 20.5.** 1 × 4

Ohm's law gives a relationship between current and potential difference. According to this Law, at constant temperature, the current flowing through a conductor is directly proportional to the potential difference across its ends. The ratio of potential difference applied between the ends of a conductor and the current flowing through it is a constant quantity called resistance.

The following graph is obtained by a researcher while doing an experiment to study Ohm's law. The *I*-*V* graph for four conductors *A*, *B*, *C* and *D* having resistance  $R_A$ ,  $R_B$ ,  $R_C$  and  $R_D$  respectively are shown in the graph.



- 20.1** If all the conductors are of same length and same material, which is the thickest?  
 (a) *C* (b) *D*  
 (c) *A* (d) *B*
- 20.2** If all the conductors are of same thickness and of same material, which is the longest?  
 (a) *B* (b) *C*  
 (c) *A* (d) *D*
- 20.3** Which one of the following relations is true for these conductors?  
 (a)  $R_A > R_B > R_C > R_D$  (b)  $R_A = R_B < R_C < R_D$   
 (c)  $R_A < R_B < R_C < R_D$  (d)  $R_A = R_B = R_C = R_D$

- 20.4** If conductors  $A$  and  $B$  are connected in series and  $I - V$  graph is plotted for the combination, its slope would be:
- (a) more than that of  $A$  (b) between  $A$  and  $B$   
 (c) more than that of  $D$  (d) less than that of  $A$
- 20.5** If conductors  $C$  and  $D$  are connected in parallel and  $I - V$  graph is plotted for the combination, its slope would be:
- (a) between  $C$  and  $D$  (b) lesser than that of  $A$   
 (c) more than that of  $D$  (d) between  $B$  and  $C$

## SECTION B

- Q21. A white chemical compound becomes hard on mixing proper quantity of water. It is also used to maintain joints in fixed position. Name the chemical compound and write its chemical formula. Write the chemical equation to show what happens when water is added to this compound in proper quantity. [2]

**OR**

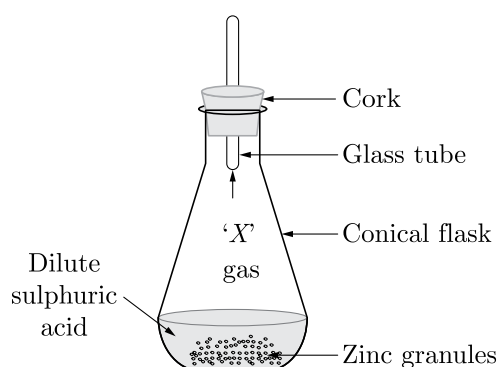
Two solutions 'A' and 'B' have pH value 3.0 and 10.5 respectively. Which of these will turn

- Blue litmus solution to red,
  - Phenolphthalein from colourless to pink? Justify your answer in each case.
- Q22. State the changes that take place in the uterus when
- Implantation of embryo has occurred
  - female gamete/egg is not fertilized
- Q23. Why is lithium with atomic number 3 and potassium with atomic number 19 are placed in group one? What will be atomic number of the first two elements in the second group? [2]

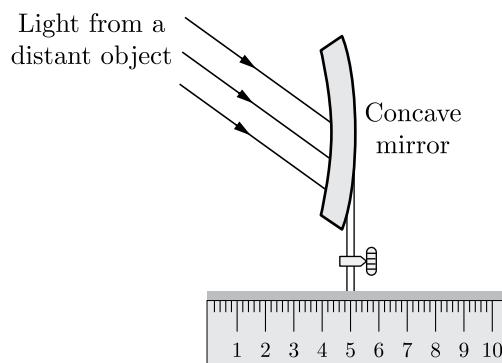
**OR**

- Name the element with atomic number 17.
- To which period does it belong to?
- To which group does it belong to?
- Write its electronic configuration.

- Q24. Observe the given figure and answer the questions that follow: [2]



- Identify the gas 'X'.
  - How will you test for the gas which is liberated in the experiment?
- Q25. In the below set-up, the focal length of the concave mirror is 4.0 cm. Where should the screen be placed on the scale to obtain a sharp image? [2]



- Q26. a. What material is used in making the filament of an electric bulb?  
 b. Name the characteristics which make it suitable for this. [2]

### SECTION C

- Q27. 2 g of ferrous sulphate crystals were heated in a hard glass test tube and observations recorded.  
 a. What type of odour is observed on heating ferrous sulphate crystals?  
 b. Name the products obtained on heating ferrous sulphate crystals.  
 c. What type of reaction is taking place. [3]

### OR

- a. Why metals are not found in their free state generally?  
 b. If a strip of aluminium with scratched clean surface is dipped into an aqueous solution of copper sulphate for little time, surface of the strip becomes brownish. What is the reason for this? Write the balanced chemical equation for the reaction.
- Q28. How do guard cells regulate opening and closing of stomatal pores? [3]
- Q29. Write the chemical formula for washing soda. How may it be obtained from baking soda? Name an industrial use of washing soda other than washing clothes. [3]
- Q30. Out of the elements H(1), Be(4), Na(11) and Mg(12).  
 a. Write the pair of elements having similar chemical properties.  
 b. State the group number of each pair,  
 c. Name one another element belonging to each of these groups. [3]
- Q31. What are covalent compounds? Why are they different from ionic compounds? List their three characteristic properties. [3]
- Q32. Why does the sun appear reddish early in the morning? Will this phenomenon be observed by an observer on the moon? Justify your answer with a reason. [3]
- Q33. Suggest three contraceptive methods to control the size of human population which is essential for the health and prosperity of a country. State the basic principle involved in each. [3]

### SECTION D

- Q34. a. Give a chemical test to distinguish between saturated and unsaturated hydrocarbon.  
 b. Name the products formed when ethane burns in air. Write the balanced chemical equation for the reaction showing the types of energies liberated.  
 c. Why is reaction between methane and chlorine in the presence of sunlight considered a substitution reaction? [5]



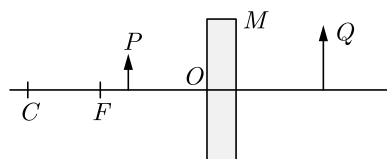
**OR**

Account for the following.

- Dry HCl gas does not change the colour of dry blue litmus paper
- Antacid tablets are used by a person suffering from stomach pain.
- Toothpaste is used for cleaning teeth.

- Q35. a. Draw a neat diagram of an excretory unit of a human kidney and label the following parts.
- Bowman's capsule
  - Renal artery
  - Glomerulus
  - Collecting duct
- b. Give one advantage of having a large number of these highly coiled structures in our kidneys.
- c. Mention any two substances which are selectively reabsorbed as the filtrate flows along the tubular part of this unit. [5]

- Q36. a. Define the following terms in the context of spherical mirrors:
- Pole
  - Centre of curvature
  - Principal axis
  - Principal focus
- b. Draw ray diagrams to show the principal focus of a :
- Concave mirror
  - Convex mirror
- c. Consider the following diagram in which  $M$  is a mirror and  $P$  is an object and  $Q$  is its magnified image formed by the mirror



State the type of the mirror  $M$  and one characteristic property of the image  $Q$ . [5]

**OR**

- Draw a ray diagram to show the formation of image by a convex lens when an object is placed in front of the lens between its optical centre and principal focus.
- In the above ray diagram mark the object-distance ( $u$ ) and the image-distance ( $v$ ) with their proper signs (+ve or -ve as per the new Cartesian sign convention) and state how these distances are related to the focal length ( $f$ ) of the convex lens in the case.
- Find the power of a convex lens which forms a real, and inverted image of magnification  $-1$  of an object placed at a distance of 20 cm from its optical centre.

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