

CLASS X (2020-21)
SCIENCE (CODE 086)
SAMPLE PAPER-8

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. Define rancidity. [1]

OR

Why is hydrogen peroxide kept in coloured bottles?

Q2. What is universal indicator? [1]

Q3. Define catenation. [1]

Q4. What will happen if platelets were absent in the blood? [1]

Q5. What will happen to a plant if its xylem is removed? [1]

OR

Which is the largest gland in the human body?

Q6. Define photolysis. [1]

Q7. Define absolute refractive index. [1]

OR

Define the term principal axis of a spherical mirror.

- Q8. What is meant by power of a lens? [1]
- Q9. Why does the sky appear dark to astronauts? [1]
- Q10. Define one volt. [1]

OR

Define the term electrical resistivity of a material.

- Q11. What does the closeness of field lines in a magnetic field signify? [1]
- Q12. What happens if a current carrying conductor is placed in the magnetic field? [1]
- Q13. Why are crop fields known as artificial ecosystems? [1]

OR

List two biotic components of a biosphere.

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 :** When HCl is added to zinc granules, a chemical reaction occurs.
Reason : Evolution of a gas and change in colour indicate that the chemical reaction is taking place. [1]
- Q15. **Assertion :** The sex of a child is determined by the mother.
Reason : Humans have two types of sex chromosomes XX and XY. [1]
- Q16. **Assertion :** Decomposers act as cleaning agents of the environment.
Reason : The decomposers recycle waste material in the hydrosphere. [1]

OR

Assertion : Green plants of the ecosystem are the producers.

Reason : Producers trap the radiant energy of the Sun and change it into chemical energy.

- Q17. **Read the following and answer any four questions from 17.1 to 17.5.** 1 × 4
Dmitri Ivanovich Mendeleev, a Russian chemist developed a Periodic Table on the basis of atomic mass and also on the similarity of chemical properties. He started with 63 elements, studied their chemical reactivity and arranged them in the order of increasing atomic masses. But there were a few instances where Mendeleev had to place an element with a slightly greater atomic mass before an element with a slightly lower atomic mass. He also left some gaps in his periodic table. He could not assign a correct position to hydrogen in his table.
Due to limitations, his periodic table was modified and was adopted as the basis of Modern Periodic Table.

17.1 The two elements selected by Mendeleev as the basis for the chemical reactivity are

- (a) hydrogen and nitrogen (b) oxygen and hydrogen
(c) hydrogen and carbon (d) oxygen and nitrogen

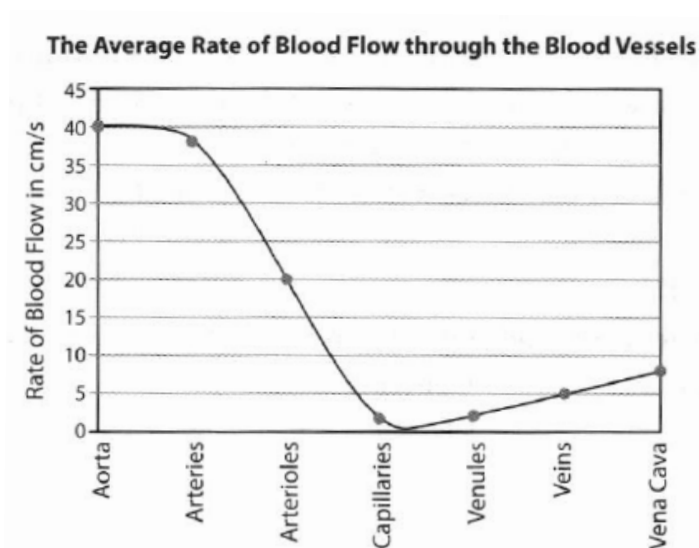
- 17.2** The placement of which of the following pair of elements was not according to Mendeleev's Periodic Law in the table?
- (a) Co and Ni (b) Li and Be
(c) N and O (d) Fe and Co
- 17.3** Mendeleev could not assign a fix position to hydrogen because
- (a) hydrogen does not react with any other element
(b) hydrogen has completely filled shell
(c) hydrogen resemble alkali metals as well as halogens in properties
(d) hydrogen is highly reactive element
- 17.4** The formula of oxide of Eka-aluminium is
- (a) Al_2O_3 (b) GeO_2
(c) Sc_2O_3 (d) Ga_2O_3
- 17.5** How many groups and periods are there in Mendeleev's Periodic Table?
- (a) 18 Groups and 7 Periods (b) 8 Groups and 6 Periods
(c) 18 Groups and 6 Periods (d) 8 Groups and 7 Periods

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

Blood transport rood, oxygen and waste materials in our bodies. It consists of plasma as a Fluid medium. A pumping organ(heart) is required to push the blood around the body. The blood now through the chambers of heart in a specific manner and direction. While Flowing throughout the body, blood exert a pressure against the wall of a vessel.

- 18.1** Oxygenated blood from lungs enters left atrium through
- (a) vena cava
(b) pulmonary artery
(c) pulmonary vein
(d) aorta

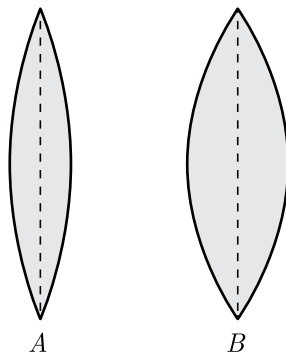
18.2 The given graph indicates the average rate of blood flow in the different blood vessels.



The rate of blood flow in the capillaries is very low because capillaries are

- (a) very narrow and have high resistance
(b) much wide and have low resistance
(c) very narrow and have low resistance
(d) much wide and have high resistance

19.1 Ravi uses two lenses A and B of same size and same material as shown. P_1 and P_2 are the powers of A and B . An object is kept at the same distance from the lenses between F and $2F$ of each lens on the principal axis in turn. Let I_1 and I_2 be the image formed by two lenses respectively. Which one of the following statements is correct for the images formed?

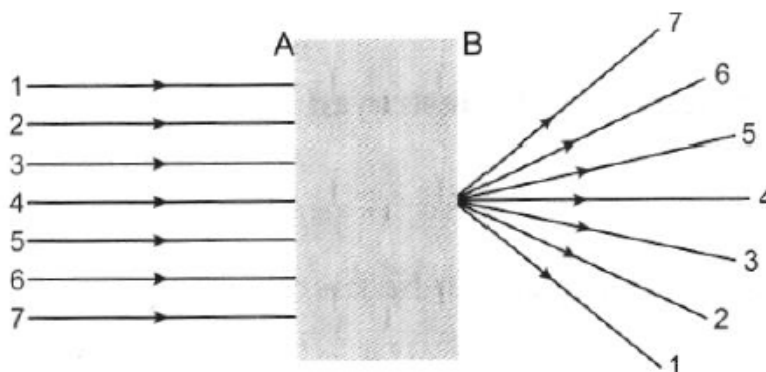


- (a) Distance of image I_2 will be less than distance of image I_1 from the lens.
- (b) Distance of image I_2 will be greater than distance of image I_1 from the lens.
- (c) Size of image I_1 will be equal to size of image I_2 .
- (d) Size of image I_1 will be lesser than size of image I_2 .

19.2 For the above two lenses

- (a) $P_1 = P_2$
- (b) $P_1 < P_2$
- (c) $P_1 > P_2$
- (d) P_1 is positive and P_2 is negative

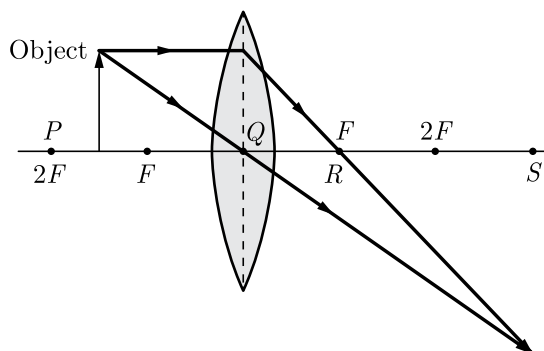
19.3 A beam of light is incident on the box through the holes on side A and emerges out of the holes on the other face of the box as shown in the figure.



Which of the following could be inside the box?

- (a) Concave lens
- (b) Convex lens
- (c) Prism
- (d) Rectangular glass plate

19.4 The image represents the rays of light travelling through a convex lens.



Where is the image most likely to form?

- (a) Position *P* (b) Position *Q*
(c) Position *R* (d) Position *S*

19.5 Rakhi conducts an experiment to produce an image of an object on a screen which is placed at 20 cm from the lens.

She uses a convex lens of focal length 15 cm for the experiment.

Where should she place the object in order to produce the sharpest image?

- (a) 20 cm in front of the lens (b) 8 cm in front of the lens
(c) 15 cm in front of the lens (d) 60 cm in front of the lens

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

In 19th century, Hans Christian Oersted, one of the leading scientist played a crucial role in understanding electromagnetism. In 1820, he accidentally discovered that a compass needle got deflected when an electric current passed through a metallic wire. An electromagnet is a temporary magnet of soft iron which retains magnetism only when the current passes around it.

Electromagnets are used in electric bell, telephone, electric motor, etc.

Oersted showed that electricity and magnetism were related phenomena. His research later created technologies such as the radio, television and fibre optics.

20.1 Which of the following is not a part of an electromagnet?

- (a) Iron (b) Toothpick
(c) Power source (d) Wire

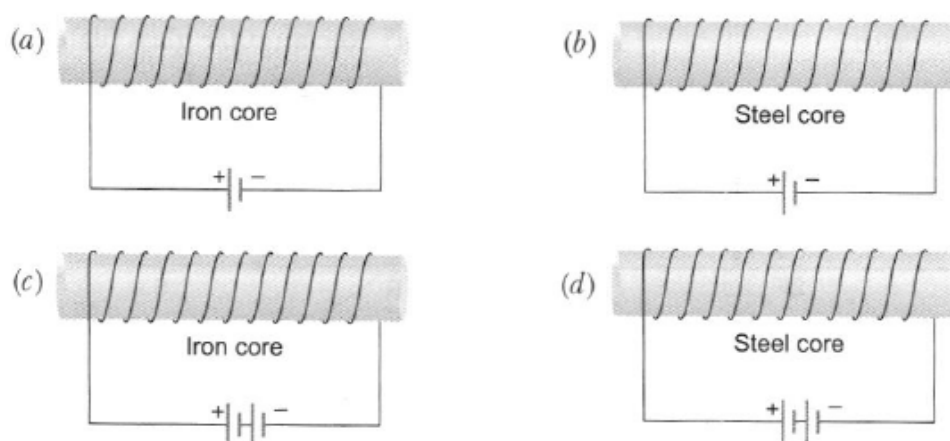
20.2 Magnetism of a magnet can be destroyed by

- (a) heating (b) inductive action of another magnet
(c) hammering (d) all the above method

20.3 Strength of an electromagnet can be increased by

- (a) increasing the cross-sectional area (b) increasing the number of turns
(c) increasing the current supply (d) all the above methods

20.4 Which of the following is the strongest electromagnet?



20.5 Which coil produces the strongest electromagnet for a given flow of current?

- (a) A 5 cm coil with 200 turns
(b) A 10 cm coil with 200 turns
(c) A 20 cm coil with 200 turns
(d) A 10 cm coil with 100 turns

SECTION-B

- Q21. Name a metal for each case:
 (i) It does not react with cold as well as hot water but reacts with steam.
 (ii) It does not react with any physical state of water. [2]
- Q22. (i) Write the number of covalent bonds in the molecule of propane, C_3H_8 .
 (ii) Which element exhibits the property of catenation to maximum extent and why? [2]

OR

Catenation is the ability of an atom to form bonds with other atoms of the same element. It is exhibited by both carbon and silicon. Compare the ability of catenation of the two elements. Give reasons.

- Q23. What processes would you consider essential for maintaining life? [2]
- Q24. What is the role of the acid in our stomach? [2]

OR

Name the parts of the body responsible for excretion in

- (i) Amoeba
 (ii) Earthworm
- Q25. State the cause of dispersion when white light enters a glass prism. Explain with a diagram. [2]
- Q26. An electric oven of 2 kW power rating is operated in a domestic electrical circuit of 220 V that has a current rating of 5 A. What result do you expect? Explain. [2]

SECTION-C

- Q27. (i) Write two observations when lead nitrate is heated in a test tube.
 (ii) Name the type of reaction.
 (iii) Write a balanced chemical equation to represent the above reaction. [3]
- Q28. Samples of four metals A, B, C and D were taken and added to the following solution one by one. The results obtained have been tabulated as follows:

Metal	Iron(II) sulphate	Copper(II) sulphate	Zinc sulphate	Silver nitrate
A	No reaction	Displacement	–	–
B	Displacement	–	No reaction	–
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

Use the table above to answer the following questions about metals A, B, C and D.

- (i) Which is the most reactive metal?
 (ii) What would you observe, if B is added to a solution of copper(II) sulphate?
 (iii) Arrange the metals A, B, C and D in the order of decreasing reactivity. [3]
- Q29. Elements have been arranged in the following sequence on the basis of their increasing atomic masses.
 F, Na, Mg, Al, Si, P, S, Cl, Ar, K
 (i) Pick two sets of elements which have similar properties.
 (ii) The given sequence represents which law of classification of elements? [3]

Q30. A variegated leaf with green and yellow patches is used for an experiment to prove that chlorophyll is required for photosynthesis. Before the experiment the green portions (A) and the pale yellow portions (B) are observed. What will be the colour of 'N'. just before and after the starch test? Also write the equation of photosynthesis and mark, as well as validate from which molecule the by-product is obtained. [3]

Q31. In a pea plant, the trait of flowers bearing purple colour (PP) is dominant over white colour (pp). Explain the inheritance pattern of F_1 and F_2 generations with the help of a cross following the rules of inheritance of traits. State the visible characters of F_1 and F_2 progenies. [3]

OR

What is variation? How is variation created in a population? How does the creation of variation in a species promote survival?

Q32. State the laws of refraction of light. Explain the term 'absolute refractive index of a medium' and write an expression to relate it with the speed of light in vacuum. [3]

Q33. Why should there be equitable distribution of resources? List three forces that would be working against an equitable distribution of our resources. [3]

SECTION-D

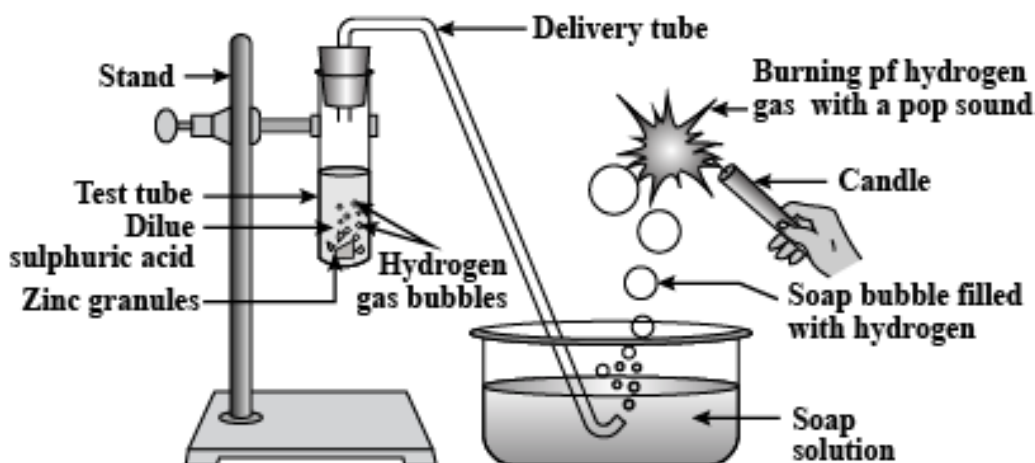
Q34. Equal length of magnesium ribbon are taken in two test tubes 'A' and 'B'. H_2SO_4 is added to test tube 'A' and H_2CO_3 in the test tube 'B' in equal amounts:

- Identify the test tube showing vigorous reaction.
- Give reason to support your answer.
- Name the gas liberated in both the tubes. How will you prove its liberation?
- Write chemical equations for both reactions.
- Out of the acids taken above, which one will have
 - lower pH value?
 - lower H^+ ion concentration respectively?

[5]

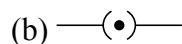
OR

- In the following schematic diagram for the preparation of hydrogen gas as shown in figure, what would happen if following changes are made?
 - In place of zinc granules, same amount of zinc dust is taken in the test tube.
 - Instead of dilute sulphuric acid, dilute hydrochloric acid is taken.
 - Sodium hydroxide is taken in place of dilute sulphuric acid and the tube is heated.



- How do metal carbonates and metal hydrogencarbonates react with acids?

- Q35. (i) Describe the various steps involved in the process of binary fission with the help of a diagram.
 (ii) Why do multicellular organisms use complex way of reproduction? [5]
- Q36. (i) Name an instrument that measures electric current in a circuit. Define the unit of electric current.
 (ii) What do the following symbols represent in a circuit diagram?

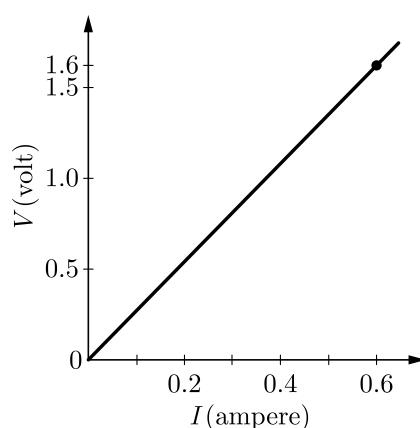


- (iii) An electric circuit consisting of a 0.5 m long nichrome wire XY , an ammeter, a voltmeter, four cells of 1.5 V each and a plug key was set up.

(a) Draw the electric circuit diagram to study the relation between the potential difference maintained between the points 'X' and 'Y' and the electric current flowing through XY .

(b) Following graph was plotted between V and I values using above circuit:

What would be the values of $\frac{V}{I}$ ratios when the potential difference is 0.8 V, 1.2 V and 1.6 V respectively? What conclusion do you draw from these values?



OR

- (i) What are magnetic field lines? How is the direction of magnetic field at a point in a magnetic field determined using field lines?
- (ii) Two circular coils 'X' and 'Y' are placed close to each other. If the current in the coil 'X' is changed, will some current be induced in the coil 'Y'? Give reason.
- (iii) State 'Fleming's right hand rule'.

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