# CLASS X (2019-20)
# SCIENCE (CODE 086)
# SAMPLE PAPER-17

**Time : 3 Hours** **Maximum Marks : 80**

**General Instructions :**

(i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
(ii) All questions are compulsory.
(iii) Internal choice is given in each sections.
(iv) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
(v) All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.
(vi) All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80-90 words each.
(vii) This question paper consists of a total of 30 questions.

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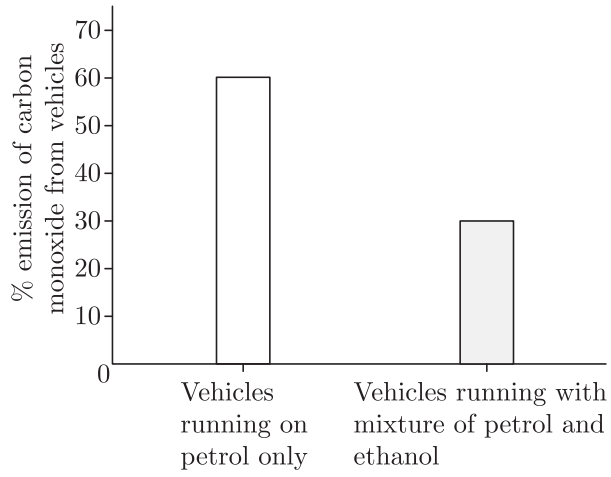
## SECTION A

Q1. What is the function of iris in human eye? [1]

Q2. Name the phenomenon responsible for the reddish appearance of the sun during sunrise and sunset. [1]
Scattering of light

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**
Ethanol or ethyl alcohol is an important organic compound. It burns in air to form carbon dioxide and water. It is used in industries, hospitals and homes. Ethanol is supplied to hospitals and research laboratories without charging different taxes. Therefore, to prevent its misuse for drinking, it is mixed with some poisonous chemicals. Drinking such an alcohol causes blindness, liver damage and even death.




**3.1** Which substance is most commonly added to ethyl alcohol to make it unfit for drinking? [1]

**3.2** Which organ in human body is most affected by the excessive intake of alcoholic drinks? [1]

**3.3** Ethanol has no effect on litmus solutions. Why? [1]

**3.4** Based on the data represented in the bar graph given alongside, why is there a reduction in emission of carbon monoxide from vehicles when a mixture of petrol and ethanol was used as fuel? [1]

Q4. **Question numbers 4.1-4.4 are based on the given paragraph and table. On the basis of understanding of the paragraph, table and the related studied concepts, answer the questions that follow**.

Air pollution is the contamination of air with undesirable gases and particulate matter. The substances that cause pollution are called pollutants. These pollutants are either gaseous pollutants like oxides of carbon, sulphur ,nitrogen, etc., or particulate matter in the form of dust, smoke, fumes or mist. Chimneys of industries fossil fuel burning and exhaust of vehicles are responsible for adding oxides of carbon, sulphur and nitrogen in the atmosphere. These oxides get mixed with rain water.

Air pollution is the fifth largest killer in India taking approx. 6.2 lakhs lives per year.

Table: Status of ambient air quality in five Metropolitan cities of India (Year 2011)

| S. No. | Name of the city | State | 2011 | | |
|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_2$ | PM10 |
| 1. | Delhi | U.T. | 6 | 61 | 222 |
| 2. | Chennai | Tamil Nadu | 9 | 24 | 92 |
| 3. | Hyderabad | Andhra Pradesh | 5 | 28 | 74 |
| 4. | Malappuram | Kerala | 2 | 5 | 30 |
| 5. | Raipur | Chhattis-garh | 15 | 42 | 310 |

**4.1** List any two ways to minimise air pollution caused by burning of fossil fuels. [1]

**4.2** Out of the three elements - carbon, nitrogen and sulphur; which element has 4 valence electrons and is placed in group 14? [1]

**4.3** In winter season, visibility reduces in heavily polluted cities due to the [1]

(a) formation of smog.

(b) reduction in humidity.

(c) formation of ozone gas.

(d) excess of burnt hydrocarbons.

**4.4** Refer to the data represented in the table, select from the following the reason why the people of Raipur are most likely to suffer from respiratory diseases? [1]

(a) Concentration of particulate matter is higher than the required amount.

(b) Concentration of $NO_2$ and $SO_2$ is less than the required amount.

(c) Concentration of $NO_2$ and particulate matter is less than the required amount.

(d) Concentration of $NO_2$ and $SO_2$ is very high.

Q5. The decreasing metallic character of the elements - Na, Al, P, S and Mg is [1]

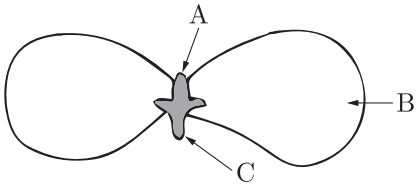
(a) Na > Mg > Al > P > S

(b) S > P > Al > Mg > Na

(c) Na > Al > Mg > P > S

(d) Al > Na > Mg > S > P

Q6. The parts A, B and C shown in the figure are sequentially: [1]




(a) cotyledon, plumule and radicle
(b) plumule, radicle and cotyledon
(c) plumule, cotyledon and radicle
(d) radicle, cotyledon and plumule.

**OR**

The opening at the base of the ovule is known as [1]
(a) style (b) stigma
(c) micropyle (d) radicle

Q7. Which of the following gases can be used for storage of fresh sample of an oil for a longer duration? [1]
(a) $CO_2$ or $O_2$ (b) $N_2$ or $O_2$
(c) $CO_2$ or $He_2$ (d) $N_2$ or He

**OR**

Which one of the following involve a chemical reaction?
(a) Evaporation of water
(b) Storing on nitrogen gas under pressure
(c) Keeping petrol in a China dish in open
(d) Heating magnesium wire in the presence of air at high temperature

Q8. A girl standing in a street in front of a large window glass pane of a house sees her own image bigger than herself. The glass pane is [1]
(a) plane (b) cylindrical outside
(c) concave outside (d) convex outside

**OR**

Under which one of the following conditions a concave mirror can form a real image larger than the object?
(a) When the object is kept at a distance equal to its radius of curvature.
(b) When object is kept at a distance less than its focal length.
(c) When object is placed between the focus and centre of curvature.
(d) When object is kept at a distance greater than its radius of curvature.

Q9. If a round, green seeded pea plant (RR yy) is crossed with wrinkled, yellow seeded pea plant, (rr YY), the seeds produced in $F_1$ generation will be [1]
(a) round and yellow (b) round and green
(c) wrinkled and green (d) wrinkled and yellow

Q10. Consider the following statements about the aqueous solutions of acids and bases:
A. Lower the pH, stronger the base
B. Lower the pH, weaker the base
C. Higher the pH, weaker the acid
D. Higher the pH, stronger the acid.

The correct statements are [1]

(a) A and B (b) B and C

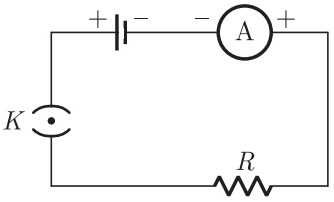
(c) C and D (d) A and D

Q11. A hypermetropic person with near point 1 m wants to read newspaper keeping it at a distance of 25 cm. The power of the corrective lens should be [1]

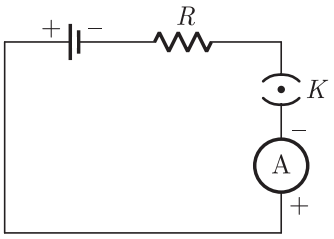
(a) +1.0 D (b) –1.0 D

(c) –3.0 D (d) +3.0 D

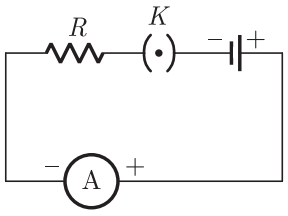
Q12. Consider the following three circuits in which a cell, a resistor, a key and an ammeter are arranged as shown. The current recorded by the ammeter will be [1]




(A)




(B)




(C)

(a) maximum in A (b) minimum in B

(c) maximum in C (d) same in all the cases

**For question numbers 13 and 14, 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.

Q13. **Assertion :** Wild cabbage is the ancestor and cauliflower and broccoli are its varieties which have been obtained by evolution.
**Reason :** Natural selection has played a major role in the evolution of cauliflower and broccoli. [1]

Q14. **Assertion :** While passing through a glass prism the violet component of white light deviates the most and the red component deviates the least.

**Reason :** The refractive index of glass for red light is highest and for violet light is lowest. [1]

## SECTION B

Q15. Write the balanced chemical equations for the following reactions and identify the type of reaction in each case.
(a) Magnesium ribbon is burnt in an atmosphere of nitrogen gas to form solid magnesium nitride.
(b) Chlorine gas is passed in an aqueous potassium iodide solution to form potassium chloride solution and solid iodine. [3]

Q16. You have four solutions A, B, C and D. The pH of solution A is 2; B is 9; C is 12 and D is 7.
(a) Identify the most acidic and most basic solution.
(b) Arrange the above four solutions in the increasing order of $H^+$ ion concentration.
(c) State the change in colour of pH paper on dipping it in solutions C and D. [3]

Q17. Two elements P and Q belong to the same period of the Modern Periodic Table and are in Group 1 and Group 2 respectively. Compare their following characteristics in tabular form: [3]
(a) The number of electrons in their atoms
(b) The sizes of their atoms
(c) Their metallic characters
(d) Their tendencies to lose electrons
(e) The formula of their oxides
(f) The formula of their chlorides

**OR**

Taking the example of an element with atomic number 16, explain how the electronic configuration of the atom of an element relates to its position—group and period in the Modern Periodic Table. Also explain how the valency of an element is calculated on the basis of its atomic number. [3]

Q18. How do auxins promote the growth of a tendril around a support? [3]

Q19. What is meant by the feedback mechanism in human beings? Explain by giving one example. [3]

Q20. Explain with an example, how each one of the following provides evidences in favour of evolution in organisms: [3]
(a) Homologous organs
(b) Analogous organs
(c) Fossils

**OR**

Explain the following:
(a) Speciation
(b) Natural Selection [3]

Q21. What is scattering of light? Use this phenomenon to explain (a) why the clear sky appears blue and (b) the sun appears reddish at sunrise. [3]

Q22. Suppose you have a circular loop of copper wire through which a current flows clockwise. If this loop is lying on a table, draw the pattern of magnetic field lines of this current carrying loop. State the rule you can apply to determine the direction of the field lines in this case. [3]

Q23. Explain the function of fuse in a domestic electric circuit. An electric oven having power rating 2000 W, 220 V is used in an electric circuit, having a fuse of 5 A rating. What is likely to happen when the oven is switched on? Explain. [3]

**OR**

What is the role of fuse used in series with an electrical appliance? Why should a fuse with defined rating not be replaced by one with a larger rating? [3]

Q24. (a) Why are solar heating devices painted black?
(b) Name two solar devices and state two limitations of each of these devices. [3]

## SECTION C

Q25. (a) Name the gas which is liberated when an acid reacts with a metal. How will you test the presence of this gas?
(b) Write the chemical equation for the reaction of zinc metal with
(i) hydrochloric acid
(ii) sodium hydroxide
State the chemical name of the salts obtained in each case.
(c) Identify the acid and base for ammonium chloride salt. What would be the nature of this salt? Mention the pH range of this salt. [5]

**OR**

(a) What is corrosion of metals? Name a metal which does not corrode and the one which corrodes when exposed to the atmosphere.
(b) Metal M reacts with oxygen to form metallic oxide (MO). This oxide reacts with moisture and carbon dioxide of the atmosphere to form a basic carbonate. Metal M prevents rusting of iron. Identify the metal M and explain how does it prevent rusting of iron. [5]

Q26. Both soap and detergent are some type of salts. What is the difference between them? Describe in brief the cleansing action of soap. Why do soaps not form lather in hard water? List two problems that arise due to the use of detergents instead of soaps. [5]

Q27. (a) Draw a neat diagram of cross-section of human heart. Name and label the following on the diagram:
(i) structure/part that divides heart into right and left halves and prevents mixing of oxygenated and deoxygenated blood;
(ii) the main artery that carries blood away from the heart;
(iii)chamber that receives deoxygenated blood from various parts of the body;
(iv)chamber from where oxygenated blood is pumped out to various parts of the body.
(b) Write the function of valves present in between atria and ventricles.
(c) Write one structural difference between the composition of artery and veins. [5]

Q28. (a) Name the human male reproductive organ that produces sperms and also secretes a hormone. Write the functions of the secreted hormone.
(b) Name the parts of the human female reproductive system where
(i) fertilization takes place;
(ii) implantation of the fertilized egg occurs.
(c) What happens when egg is not fertilised? [5]

**OR**

Draw a labelled diagram of the longitudinal section of a flower exhibiting germination of pollen on stigma and write the function of (a) stigma, (b) pollen tube and (c) female germ cell. [5]

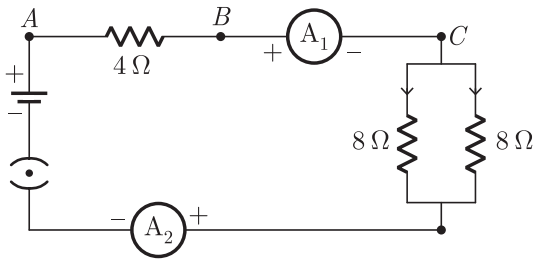
Q29. One half of a convex lens of focal length 10 cm is covered with a black paper. Can such a lens produce a complete image of an object placed at a distance of 24 cm from the lens? Draw a ray diagram to justify your answer. [5]

A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image.

**OR**

To construct ray diagrams, two rays of light are generally so chosen that it is easy to determine their directions after reflection from a mirror. Choose two such rays and state the path/direction of these rays after reflection from a concave mirror. Use these two rays to find the position and nature of the image of an object placed at a distance of 8 cm from a concave mirror of focal length 12 cm. You have two lenses A and B of focal lengths +10 cm and –10 cm respectively. State the nature and power of each lens. Which of the two lenses will form a virtual and magnified image of an object placed 6 cm from the lens?

Q30. Find out the following in the electric circuit given in the figure.




(a) Effective resistance of two $8\,\Omega$ resistors in the combination.
(b) Current flowing through $4\,\Omega$ resistor.
(c) Potential difference across $4\,\Omega$ resistance.
(d) Power dissipated in $4\,\Omega$ resistor.
(e) Difference in ammeter readings, if any. [5]