CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-12

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

General Instructions :

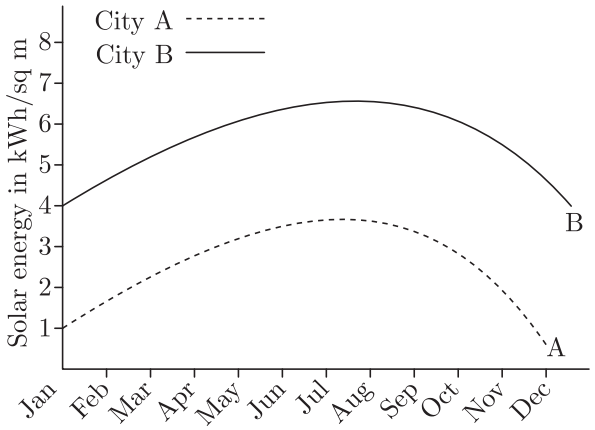
(i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
(ii) All questions are compulsory.
(iii) Internal choice is given in each sections.
(iv) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to 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.

SECTION A

Q1. State two reasons for the need of conservation of forest and wildlife. [1]

Q2. List two characteristic properties of the images formed by plane mirrors. [1]

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**
Sun is the most important source of heat and energy for life on the earth. Solar radiations are capable of producing heat or generating electricity. India is gifted with vast solar energy potential. About 5,000 trillion kWh energy is incident over our land per year with most parts receiving 4-7 kWh per sq m per day. Solar energy is expected to become increasingly attractive as a renewable energy source because of its inexhaustible supply and its non-polluting nature. Solar power in India is a fast developing industry. Telengana currently has 1300 MW installed capacity of solar power and presently is the highest solar power generator in our country.



3.1 Which is the ultimate source of almost all our sources of energy? [1]

3.2 Why is Sun called a renewable source of energy? [1]

OR

Write one disadvantage of most renewable energy sources. [1]

3.3 Which process converts solar energy into chemical energy in nature? [1]

3.4 Based on the data represented in graph given alongside, which of the two cities - A or B would be an ideal location for establishing a solar panel farm and why? [1]

Q4. **Question numbers 4.1-4.4 are based on two tables given below. Study these tables related to haemoglobin levels and answer the questions that follow.**

Table A: Haemoglobin level chart

Remarks	**Haemoglobin (g/dL)**
Doctor's advice needed	9-7
	7-4
Good	10-13
Excellent	14-16

Table B: Haemoglobin levels of Patients

Checking Time	**Haemoglobin (g/dL)**	
	Patient X	**Patient Y**
Blood test	4	6

4.1 Refer to table B showing the haemoglobin level reports of patients (X and Y). Which disease can be diagnosed from the given data? [1]

4.2 Name the element which is transported by haemoglobin from lungs to all parts of the body. [1]

4.3 In human beings haemoglobin has a very high affinity for and X and is present in Y. Identify X and Y respectively. [1]

(a) Oxygen; red blood corpuscles

(b) Carbon dioxide; red blood corpuscles

(c) Oxygen; white blood corpuscles

(d) Carbon dioxide; white blood corpuscles

4.4 The haemoglobin level which is considered excellent is [1]

(a) 15 g/dL (b) 10 g/dL

(c) 7 g/dL (d) 4 g/dL

Q5. In the Modern Periodic Table, the most correct statement about a period is [1]

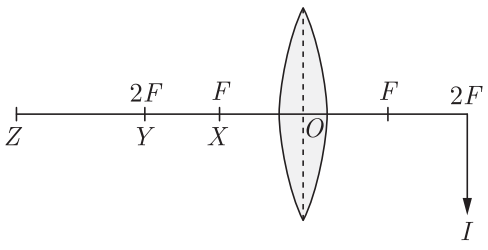
(a) The first element is an alkali metal and the last element is a halogen.

(b) The first element is a noble gas and the last one is an alkali metal.

(c) The first element is an alkali metal and the last element is a noble gas.

(d) The first element is an alkali metal except period 1 and the last element has 7 valence electrons.

Q6. A student wants to produce an image I by a convex lens in a position as shown in the adjoining figure. He should place the object [1]



(a) between O and X (b) between X and Y

(c) at Y (d) between Y and Z

Q7. Which of the following are endothermic reactions?
I. Dilution of an acid
II. Reaction between water and quick lime
III. Sublimation of camphor
IV. Evaporation of a liquid [1]
(a) I and II (b) I and III
(c) II and IV (d) III and IV

Q8. In order to focus on distant or nearby objects [1]
(a) the retina moves in or out.
(b) the pupil gets smaller or larger.
(c) the eye lens moves in or out.
(d) the eye lens becomes thinner or thicker.

Q9. Iron filings were dipped in an aqueous solution filled in a beaker. After about an hour it was observed that the colour of the solution has changed. The solution in the beaker was that of [1]
(a) $Al_2(SO_4)_3$ (b) $ZnSO_4$
(c) $CuSO_4$ (d) $FeSO_4$

OR

What type of reaction is represented by the given equation?
$CaO + H_2O \longrightarrow Ca(OH)_2$ [1]
(a) Displacement (b) Precipitation
(c) Combination (d) Decomposition

Q10. The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light [1]
(a) is scattered the most by smoke or fog.
(b) is scattered the least by smoke or fog.
(c) is absorbed the most by smoke or fog.
(d) moves fastest in air.

Q11. To get rid of pain and mild irritation caused due to indigestion, people use [1]
(a) magnesium hydroxide (b) sodium hydroxide
(c) calcium hydroxide (d) potassium hydroxide

Q12. The focal length of the eye lens decreases when eye muscles [1]
(a) contract and the lens becomes thicker.
(b) contract and the lens becomes thinner.
(c) are relaxed and the lens becomes thinner.
(d) are relaxed and the lens becomes thicker.

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 the 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 :** It is advisable to add water to acid and not acid to water and keeping the solution continuously stirred.
Reason : The process of dissolving an acid into water is a highly exothermic process. [1]

Q14. **Assertion :** Positive charge inside the cell always goes from positive terminal to the negative terminal. [1]
Reason : Positive charge inside the cell may go from negative terminal to the positive terminal.

OR

Assertion : Resistivity of material may-change with temperature.
Reason : Resistivity is a material property & independent on temperature.

SECTION B

Q15. Balance each of the following equations and identify the type of chemical reaction represented by it.

(a) $N_2 + H_2 \xrightarrow[773\,K]{\text{Catalyst}} NH_3$

(b) $FeSO_4 \xrightarrow{\text{Heat}} Fe_2O_3 + SO_2 + SO_3$

(c) $BaCl_2 + Al_2(SO_4)_3 \longrightarrow AlCl_3 + BaSO_4$ [3]

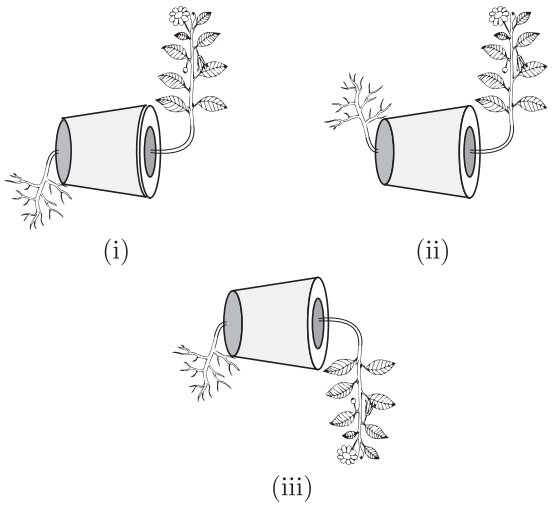
Q16. What is water of crystallisation? Name and give the formula of two salts which contain water of crystallisation. [3]

Q17. The elements of the second period of Modern Periodic Table along with their atomic number are given below.
B(5), Be(4), O(8), N(7), Li(3), C(6), F(9)
(a) Arrange these elements in the same order as they are in the periodic table.
(b) Which element has the (i) largest and (ii) smallest atom?
(c) Why does the atomic radius change as we move from left to right across a period? [3]

OR

Three elements A, B and C have atomic numbers 7, 8 and 9 respectively.
(a) What would be their positions in the Modern Periodic Table (state group number and period number of each)?
(b) Arrange A, B and C in the decreasing order of their atomic radius.
(c) Which of the three elements is most reactive and why? [3]

Q18. (a) How does phototropism occur in plants?
(b) Among figures (i), (ii) and (iii), which appears more accurate and why? [3]



(i) (ii)

(iii)

Q19. What is the need for a system of control and coordination in an organism? [3]

Q20. List two reasons to justify the selection of garden pea plants by Mendel for his experiments. Distinguish between dominant genes and recessive genes. [3]

OR

Define genetics. Why is decrease in the number of surviving tigers a cause of concern from the point of view of genetics? Explain briefly. [3]

Q21. What is meant by power of accommodation of the eye? A person is unable to see distinctly the objects placed beyond 6 m. Name the defect of vision he is suffering from. List two possible causes of this defect and write the nature of lens generally prescribed by the doctors for its correction.[3]

OR

Why do stars twinkle but not the planets? [3]

Q22. (a) What is a solenoid?
(b) Sketch the pattern of magnetic field lines in and around a current-carrying solenoid.
(c) How can you determine the north pole of a current-carrying solenoid with the help of a bar magnet? [3]

Q23. An electron beam enters a uniform magnetic field at right angles to it. State the direction in which this electron beam will deflect. State the principle we use to determine the direction of force experienced by the electron beam. What would happen if instead of electron beam, alpha particles enter the magnetic field with same velocity? [3]

Q24. What are the limitations in obtaining energy from (a) wind (b) wave and tidal energy? [3]

SECTION C

Q25. (a) List two differences between metal and non-metal on the basis of their chemical properties.
(b) In the formation of a compound AB_2, atom A donates one electron each to two atoms of B. If the atomic numbers of A and B are 12 and 9 respectively, show the electron-dot structures of A and B and the formation of AB_2. Name the bond formed in the compound and list three properties of the compound formed by such bonding. [5]

OR

(a) Write the steps involved in the extraction of pure metals in the middle of activity series from their carbonate ores.
(b) How is copper extracted from its sulphide ore? Explain the various steps supported by chemical equations. Draw labelled diagram for the electrolytic refining of copper. [5]

Q26. An organic compound A on heating with conc. H_2SO_4 forms another compound B. The compound B on addition of hydrogen in the presence of nickel catalyst forms a saturated compound C. One molecule of C on combustion in air forms two molecules of CO_2 and three molecules of H_2O. Identify A, B and C and write chemical equations for the reactions involved. [5]

Q27. (a) What is nutrition? List its two basic modes.
(b) With the help of labelled diagram explain the process of nutrition in a unicellular eukaryotic organism. [5]

OR

(a) Give reason for the following:
(i) Rings of cartilage are present in trachea.

(ii) Lungs always contain a residual volume of air.

(b) Name the property that causes tendril to circle around the object. Explain how it happens and how is plant benefited by it. [5]

Q28. (a) Define the term reproduction.

(b) How are more copies of DNA created by the cell?

(c) During sexual reproduction, if copies of DNA from two individuals combine and then this will double the amount of DNA in the daughter organism. How is this problem solved by the organisms? [5]

Q29. (a) List in tabular form two differences between real and virtual images formed by lenses.

(b) An object placed 45 cm from a lens forms an image on a screen 90 cm on the other side of the lens. Use the lens formula to determine the nature and focal length of the lens. What is the size of the image, if the object is 5 cm in height? [5]

OR

(a) Name the types of mirror(s) that should be used, (i) as a rear view mirror; (ii) by the dentists. Also mention the reason(s) of their use.

(b) An object of size 4 cm is placed at a distance of 25 cm from a concave mirror of focal length 15 cm. Use mirror formula to determine the position and nature of the image. Also find the size of the image formed. [5]

Q30. (a) Define electric power. A device of resistance R is connected across a source of voltage V and draws a current I. Derive an expression for power in terms of current and resistance.

(b) An electric bulb is connected to a 200 V generator. The current is 0.5 A. What is the power of the bulb? [5]