

CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-5

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. Write the next higher homologue of the following : [1]
- i. C_3H_6
 - ii. C_5H_8

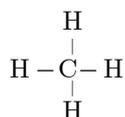
- Q2. What do we call the movement of shoot towards light? [1]

- Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**

The compounds entirely consisting of carbons and hydrogens are known as hydrocarbons. There are different categories in which hydrocarbons are divided out of which the two are :

Saturated Hydrocarbons : The hydrocarbons having only single bonds between the carbon atoms are called saturated hydrocarbons. This includes alkanes having a general formula C_nH_{2n+2} . The first member of homologous series of alkanes is methane (CH_4).

Structure of methane is as follows:



Unsaturated Hydrocarbons : The hydrocarbons having double and triple bonds between the carbon atoms are called unsaturated hydrocarbons. This includes alkenes and alkynes having general formula C_nH_{2n} and C_nH_{2n-2} , respectively. The first member of homologous series of alkenes is Ethene (C_2H_4). The structure of ethene is as follows: $H_2C = CH_2$.

The first member of homologous series of alkynes is Ethyne (C_2H_2) having structural formula $HC \equiv CH$.

- 3.1** Select alkenes and alkynes from the following: [1]
- C_2H_4 , C_3H_4 , C_2H_2 , C_4H_8

3.2 Name the reaction used to convert saturated hydrocarbons to unsaturated hydrocarbons. [1]

3.3 Name the catalyst used in the above conversion reaction. [1]

3.4 Draw the structure of hydrocarbons with general formula C_nH_{2n-2} where $n = 3$. [1]

Q4. Question numbers 4.1-4.4 are based on the two tables given below. Study these tables and answer the questions that follows:

Table A

Normal Hemoglobin Count Ranges Widely Accepted by Physicians.	
Birth	13.5 to 24.0 g/dl (mean 16.5 g/dl)
<1 month:	10.0 to 20.0 g/dl (mean 13.9 g/dl)
1 to 2 months:	10.0 to 18.0 g/dl (mean 11.2 g/dl)
2 to 6 months:	9.5 to 14.0 g/dl (mean 12.6 g/dl)
0.5 to 2 yrs:	10.5 to 13.5 g/dl (mean 12.0 g/dl)
2 to 6 yrs:	11.5 to 13.5 g/dl (mean 12.5 g/dl)
6 to 12 yrs:	11.5 to 15.5 g/dl (mean 13.5 g/dl)

Table B

Females	
Age 12 to 18 yrs:	12.0 to 16.0 g/dl (mean 14.0 g/dl)
Age > 18 yrs:	12.1 to 15.1 g/dl (mean 14.0 g/dl)
Male	
Age 12 to 18 yrs:	13.0 to 16.0 g/dl (mean 14.5 g/dl)
Age > 18 yrs:	13.6 to 17.7 g/dl (mean 15.5 g/dl)

4.1 Infer the disease which can be diagnosed from the given data in a girl studying in high school and has hemoglobin level 8 g/dl. [1]

4.2 A student of class 10th likes to eat a diet rich in carbohydrates, junk food has been found anaemic hence he finds it difficult to concentrate on his studies. To help him out of this situations, name any four foods that he must include in his diet. [1]

4.3 A person of 18 years has pale skin, feels dizzy after mild exercise and feels very tired. He got his Hb levels tested. His tests may have shown haemoglobin levels– [1]

(a) $14 > \text{g/dl}$ (b) $< 11 \text{ g/dl}$

(c) $> 16 \text{ g/dl}$ (d) $< 17 \text{ g/dl}$

4.4 Role of haemoglobin is not to [1]

- (a) Attach oxygen entering the lungs
- (b) Serve as respiratory pigment
- (c) Increase residual volume of our lungs.
- (d) Decreases residual volume of our lungs

Q5. 2 ampere current is flowing through a conductor from a 10 volt emf source then resistance of conductor is [1]

(a) 20Ω (b) 5Ω

(c) 12Ω (d) 8Ω

OR

A voltmeter has a least count 0.05 volt. While doing Ohm's law experiment, a student observed that pointer of the voltmeter coincides with 15th division.

The observed reading is :

- (a) 0.75 V (b) 0.075 V
(c) 7.5 V (d) 75 V

Q6. A convex lens has a focal length of 12 cm. At which of the following positions should an object be placed so that this convex lens may act as magnifying glass ? [1]

- (a) 26 cm (b) 17 cm
(c) 9 cm (d) 24 cm

Q7. The embryonal axis above the cotyledons is called : [1]

- (a) Hilum (b) Radicle
(c) Epicotyle (d) Seed coat

Q8. When a pH paper is dipped in a solution, the colour of the pH paper changes to deep red. What will be the possible pH of the solution? [1]

- (a) 2 (b) 6
(c) 8 (d) none of these

OR

All of the following properties of acetic acid are true except : [1]

- (a) it is colourless (b) it is odourless
(c) it is miscible in water (d) it turns blue litmus red

Q9. A blue litmus paper was first dipped in dil. HCl and then in dil. NaOH solution. It was observed that the colour of the litmus paper : [1]

- (a) changed to red
(b) changed to first red and then to blue
(c) changed to blue to colourless
(d) remained blue in both the solutions

Q10. The freshly prepared aqueous solution of ferrous sulphate appears [1]

- (a) dark green (b) pale green
(c) light blue (d) dark blue

Q11. Kavya observed a slide of Amoeba with elongated nuclei. It would represent : [1]

- (a) binary fission
(b) multiple fission
(c) budding
(d) vegetative propagation

Q12. Mendeleev classified elements in- [1]

- (a) increasing order of atomic groups
(b) eight periods and eight groups
(c) seven periods and nine groups
(d) eight periods and seven groups

OR

Noble gases were included in Mendeleev's periodic table in the-

- (a) 1st group (b) 7th group
(c) 8th group (d) none of these

For question numbers 13 and 14, two statements are given-one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Assertion is true and reason is correct explanation of assertion.
- (b) Assertion is true but reason is false.
- (c) Assertion is false but reason is true.
- (d) Both are true but reason is not correct explanation of assertion.

Q13. **Assertion :**Aluminium is called a self protecting metal.
Reason : Aluminium reacts with atmospheric oxygen to form a very thin layer of aluminium oxide, which is sticky in nature. [1]

Q14. **Assertion :** The double circulation of blood is necessary in human beings.
Reason : The double circulation of blood is necessary for constant and efficient supply of oxygen to the body. [1]

SECTION B

Q15. Write an equation each for the decomposition reactions, where energy is supplied in the form of heat, light, or electricity. [3]

Q16. Explain the carbon forms compounds mainly by covalent bond. Explain in brief two main reasons for carbon forming a large number of compounds. Why does carbon form strong bonds with most of the other elements? [3]

OR

- i. Why does distilled water not conduct electricity, whereas rainwater does ?
- ii. Why do the acids not show acidic behaviour in the absence of water ? [3]

Q17. (i) Name two metals which react violently with cold water.
(ii) Write any three observations you would make when such a metal is dropped into water
(iii)How would you identify the gas evolved, if any, during the reaction ? [3]

Q18. What is Chipko movement? How did this movement ultimately benefit the local population and the environment? [3]

OR

How is ozone formed in the upper atmosphere? Why is the damage of ozone layer a cause of concern to us? State cause of this damage. [3]

Q19. Distinguish between analogous organs and homologous organs. Identify the analogous and homologous organs amongst the following : Wings of an insect, wings of a bat, forelimbs of frog, forelimbs of human. [3]

Q20. What is 'phototropism'? How does it occur in plants? Describe an activity to demonstrate phototropism. [3]

Q21. (a) What is the role of mucus in stomach? [1]
(b) What are the two vital functions of human kidney? [2]

Q22. How does the magnitude of induced current change in a closed coil, when
i. a more powerful magnet is used ?

- ii. the relative motion of the magnet with respect to the coil increases ?
- iii. the number of turns in the copper coil are decreased ? [3]

Q23. The near point of a person suffering from hypermetropia is 75 cm. Calculate the focal length and power of the lens required to enable him to read the newspaper which is kept at 25 cm from the eye. [3]

Q24. A student focussed the image of a candle flame on a white screen by placing the flame at distances from a convex lens. He noted his observation in the following table:

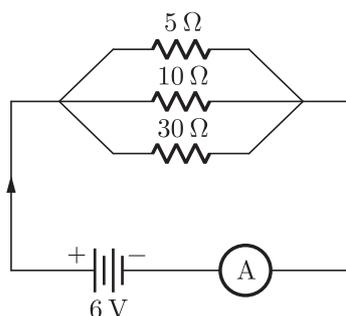
Distance of the flame from lens (cm)	Distance of the screen from lens (cm)
60	20
40	24
30	30
24	40
12	70

Analyse the above table and answer the following questions :

- i. What is the focal length of convex lens?
- ii. Which set of observation is incorrect and why?
- iii. Draw the ray diagram to show the image formation for any correct set of observation. [3]

OR

- i. For the circuit shown in the diagram, calculate :



- (a) Value of current through the 30 Ω resistor
- (b) Total resistance of the circuit
- ii. Give two advantages of connecting electrical devices in parallel with battery. [3]

SECTION C

Q25. An element X (atomic number 17) reacts with an element Y (atomic number 20) to form a divalent halide.

- i. Where in the periodic table are elements X and Y placed?
- ii. Classify X and Y as metal (s), non-metal(s) or metalloid(s).
- iii. What will be the nature of the oxide of element Y? Identify the nature of bonding in the compound formed.
- iv. Draw the electron dot structure of the divalent halide. [5]

OR

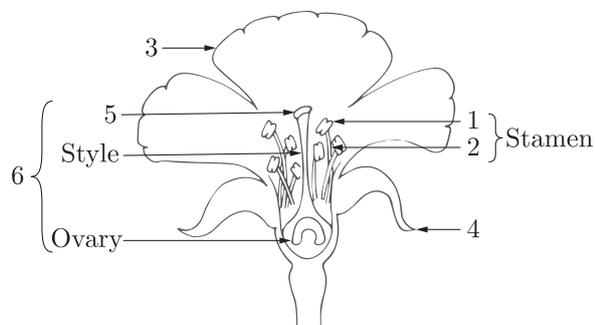
Write balanced chemical equation for the reactions taking place when :

- i. Zinc carbonate is calcinated.
- ii. Zinc sulphide is roasted.
- iii. Zinc oxide is reduced in the zinc.
- iv. Cinnabar is heated in the air

v. Manganese dioxide is heated with aluminium powder. [5]

- Q26. (i) Define the term 'isomer'.
(ii) Draw two possible isomers of the compound with molecular formula C_3H_6O and write their names.
(iii) Give the electron dot structure of the above two compound. [5]

Q27. i. In the given figure name the parts marked 1 to 6 :



ii. Differentiate between self pollination and cross pollination. [5]

- Q28. Name the main organs of the human digestive system in the order in which they are involved in the digestion of food. In what steps and how does digestion of carbohydrates and proteins take place in our body? [5]

OR

How do the guard cells regulate opening and closing of stomatal pores? Explain with the help of diagram. Also, indicate what happens to the rate of photosynthesis if stomata get blocked due to dust. [5]

- Q29. i. What do you understand by the term fuse in an electric circuit ?
ii. State two properties of a material, which make it suitable for making a fuse wire.
iii. Why is a fuse wire always placed in the live wire of an electric circuit ?
iv. How does a fuse wire protect an electric circuit ?
v. Two fuse wires A and B of the same length are rated 15 A and 5 A. Which amongst the A and B will be thicker and why ? [5]

- Q30. (i) Explain the term refraction of light.
(ii) Letters written on a paper when seen through a thick glass slab appear to be raised. Explain this phenomenon with the help of a ray diagram.
(iii) Light enters from air into diamond which has refractive index, 2.42. The speed of light in air is $3 \times 10^8 \text{ ms}^{-1}$. Calculate the speed of light in diamond. [5]