CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-13

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

General Instructions :

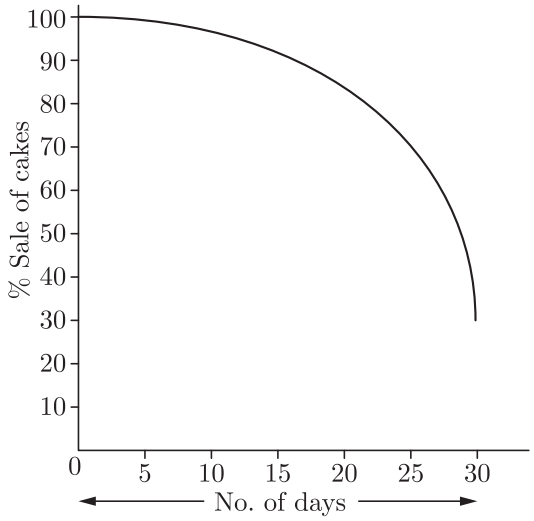
(i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
(ii) All questions are compulsory.
(iii) Internal choice is given in each sections.
(iv) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to 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. What is meant by renewable source of energy? [1]

Q2. Which fossil fuel is generally referred to as clean fuel and why? [1]

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**
To make a bread dough, a baker mixes flour, sugar and baking powder (mixture of baking soda and tartaric acid). After mixing all the ingredients, the dough is placed in a container for a few hours (in an oven). On heating, the mixture releases carbon dioxide gas leaving bubbles behind. This increases the size of the bread and makes it soft and spongy. Tartaric acid helps in removing bitter taste.



3.1 Why does the bread dough rise? [1]

3.2 'Yeast can be used in place of baking powder for making bread dough'. What is yeast? [1]

3.3 What would you use to measure pH of baking powder? [1]

3.4 Based on the graph represented alongside, answer the following questions:

A bakery shop started using baking soda instead of baking powder for baking cakes. What could be the reason for the decrease in the sale of cakes? [1]

Q4. **Question numbers 4.1-4.4 are based on the two tables given below and the related studied concepts. Analyse the tables related to blood pressure of a patient and answer the questions that follow.**

Table A: Blood Pressure Chart

Remarks	Systolic (mm of Hg)	Diastolic (mm of Hg)
Doctor's advice required	200-400	100 or higher
Good	100-140	80-89
Excellent	120	80

Table B: Blood Pressure report of a Patient

Checking Time	Systolic (mm of Hg)	Diastolic (mm of Hg)
Blood pressure for a week	130-150	100-120

4.1 Refer Table B that shows the blood pressure report of a patient. Which disease can be diagnosed from the given data? [1]

4.2 What is meant by systolic pressure? [1]

4.3 Refer Table A and find out the normal blood pressure value. [1]

(a) 140-89 mm of Hg (b) 140-100 mm of Hg

(c) 120-80 mm of Hg (d) 160-120 mm of Hg

4.4 Which part of the brain controls blood pressure? [1]

(a) Medulla (b) Cerebellum

(c) Spinal cord (d) Cerebrum

OR

Which instrument is used to measure blood pressure?

(a) Sphygmomanometer (b) Hemotocrit

(c) Stethoscope (d) Barometer

Q5. You are given four transparent liquids-water, mustard oil, kerosene and glycerine. A ray of light incident obliquely at the same angle in all the four media would bend the most in [1]

(a) water (b) mustard oil

(c) kerosene (d) glycerine

Q6. Which of the following pairs of phenomena is based on the scattering of light? [1]

(a) Twinkling of star and blue colour of the sky.

(b) Reddening of the Sun at sunrise and advanced sunrise.

(c) Delayed sunset and reddening of the Sun at sunset.

(d) Blue colour of the sky and colour of water in the deep sea.

OR

An object is kept in between two parallel plane mirrors facing each other. The number of images formed by this combination is [1]

(a) 2 (b) 4

(c) 16 (d) infinite

Q7. A mixture of copper and zinc was dropped in a flask containing dil. HCl. Hydrogen gas was evolved immediately. This happened because of the reaction of [1]

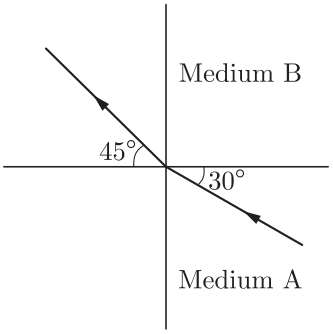
(a) copper with dil. HCl.

(b) zinc with dil. HCl.

(c) both copper and zinc with dil. HCl.

(d) copper with dil. HCl in the presence of zinc as a catalyst.

Q8. A ray of light, as shown in the figure, travels from medium A to medium B. The refractive index of medium B relative to medium A is [1]



(a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$

(c) $\frac{\sqrt{2}}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{\sqrt{2}}$

Q9. Which the following alloys contains non-metal as one of its constituents? [1]

(a) Amalgam (b) Solder

(c) Steel (d) Brass

OR

Which of the following is a characteristic of metals?

(a) They have one to three valence electrons

(b) They have 4 to 8 valence electrons

(c) They are brittle

(d) They are capable to form anions easily

Q10. If the central portion of a convex lens is painted black, the image formed by the lens will be [1]

(a) complete but with less brightness (b) complete with no effect on brightness

(c) without central portion (d) blurred

Q11. In general, the elements of group eighteen are non-reactive because they have [1]

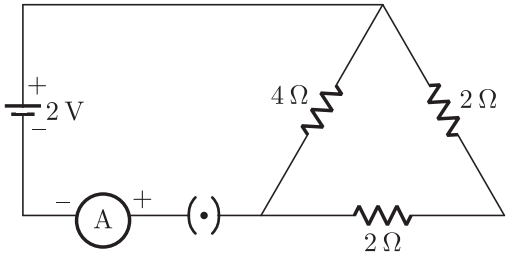
(a) a large number of neutrons.

(b) more neutrons than protons in their nuclei.

(c) outermost shells completely filled with electrons.

(d) eighteen electrons in their valence shells.

Q12. In the adjoining circuit, the reading of the ammeter is [1]



(a) 0.25 A (b) 0.5 A
(c) 1.0 A (d) 2.0 A

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 :** The energy of a charged particle moving at right angles to a uniform magnetic field does not change.
Reason : No work is done by the magnetic field on the charged particle. [1]

Q14. **Assertion :** The limitation of using solar energy is overcome by using solar cells.
Reason : Solar cells directly convert solar energy into chemical energy which can be further converted into electrical energy/electricity. [1]

SECTION B

Q15. Find out the oxidising agent (oxidant) in the following chemical reactions: [3]
(a) $Pb_3O_4 + 8HCl \longrightarrow 3PbCl_2 + Cl_2 + 4H_2O$
(b) $2Mg + O_2 \longrightarrow 2MgO$
(c) $CuSO_4 + Zn \longrightarrow Cu + ZnSO_4$
(d) $V_2O_5 + 5Ca \longrightarrow 2V + 5CaO$
(e) $3Fe + 4H_2O \longrightarrow Fe_3O_4 + 4H_2$
(f) $CuO + H_2 \longrightarrow Cu + H_2O$

Q16. An ore on treatment with dilute hydrochloric acid gives the rotten egg smell. What type of ore is this? How can the metal be obtained from its concentrated ore? [3]

OR

A boy treated a lustrous, divalent element M with sodium hydroxide. He observed the formation of bubbles in a reaction mixture. He made the same observations when this element was treated with hydrochloric acid. Suggest how he can identify the produced gas.
Write chemical equations for both the reactions. [3]

Q17. List three limitations of Newlands' Law of Octaves? [3]

Q18. What are the differences between the transport of materials in xylem and phloem? [3]

Q19. Explain the mechanism of photosynthesis. [3]

Q20. Is it possible that a trait is inherited but may not be expressed? Give a suitable example to justify this statement. [3]

OR

Describe any three methods of tracing evolutionary relationship among organisms. [3]

Q21. If the image formed by a mirror for all positions of an object placed in front of it is always erect

and diminished, what kind of mirror is it? Draw a ray diagram to justify your answer. Where and why do we usually use this kind of mirror? [3]

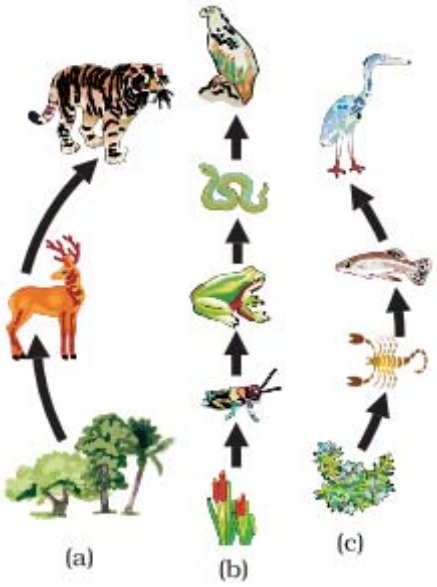
Q22. How will you infer with the help of an experiment that the same current flows through every part of the circuit containing three resistances in series connected to a battery? [3]

Q23. Draw a diagram of an electric circuit containing a cell, a key, an ammeter, a resistor of $2\,\Omega$ in series with a combination of two resistors ($4\,\Omega$ each) in parallel and a voltmeter across 41000the parallel combination. Will the potential difference across the $2\,\Omega$ resistor be the same as that across the parallel combination of $4\,\Omega$ resistors? Give reason. [3]

OR

Three resistors R_1, R_2 and R_3 are connected in parallel and the combination is connected to a battery, an ammeter, a voltmeter and a key. Draw the circuit diagram. Obtain an expression for the effective resistance of the combination of resistors in parallel. [3]

Q24. Out of the given food chains (a), (a) and (c), which one has the minimum number of trophic levels? If in each food chain, the same amount of energy is available to the plants, in which case will the organism at top of the food chain get minimum energy for survival? [3]



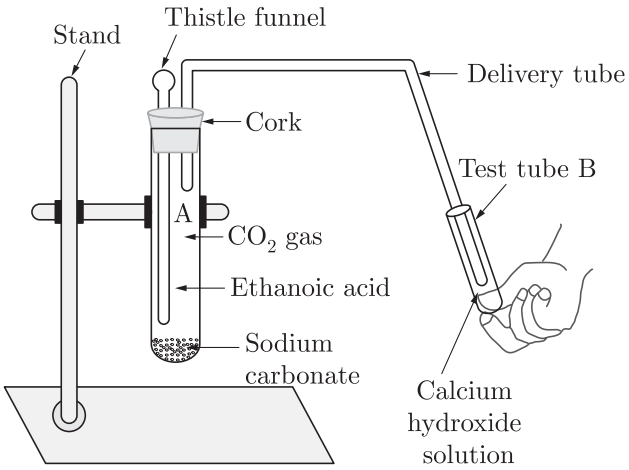
SECTION C

Q25. (a) Write the balanced chemical equations for the preparation of following salts:
(i) A soluble sulphate (by the action of an acid on a metal).
(ii) A soluble sulphate (by the action of an acid on an insoluble metal oxide).
(iii)An insoluble sulphate (by the action of an acid on another salt).
(b) Sodium reacts with oxygen to produce sodium oxide which dissolves in water to form sodium hydroxide. On adding hydrochloric acid to the base solution, salt and water are produced. Write balanced chemical equations to represent all the chemical reactions stated in the question. [5]

OR

What happens when a piece of
(a) zinc metal is added to copper sulphate solution?
(b) aluminium metal is added to dilute hydrochloric acid?
(c) silver metal is added to copper sulphate solution?
Also, write the balanced chemical equations if a reaction occurs. [5]

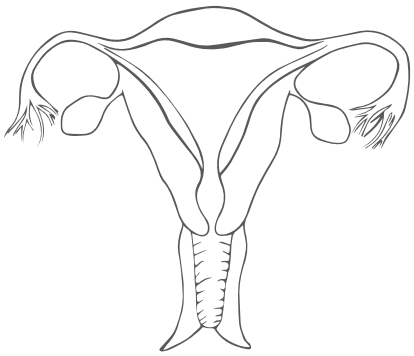
Q26. Look at the given figure and answer the following questions.



(a) What change would you observe in the calcium hydroxide solution taken in tube B?
(b) Write the reaction involved in test tubes A and B respectively.
(c) If ethanol is taken instead of ethanoic acid, would you expect the same change?
(d) How is a solution of lime water prepared in the laboratory? [5]

Q27. Name various plant hormones. Also give their physiological effects on plant growth and development [5]

Q28. (a) In the given figure, name and label the parts that perform the following functions:



(i) Production of egg
(ii) Site of fertilisation
(iii) Site of implantation
(iv) Entry of the sperms [5]

(b) What changes are observed in the uterus subsequent to the implantation of a young embryo?

OR

(a) What is reproduction? Explain two advantages of sexual reproduction over asexual reproduction.
(b) Describe the process of regeneration in planaria. Explain how this process is different from reproduction. [5]

Q29. What is Tyndall effect? Explain. List two examples where this effect can be observed. [5]

Q30. Why does a magnetic compass needle pointing North and South in the absence of a nearby magnet get deflected when a bar magnet or a current carrying loop is brought near it? Describe four salient features of the concept of magnetic field lines. [5]

OR

Explain, with the help of a labelled diagram, the distribution of magnetic field due to a current through a circular loop. Why is it that if a current carrying coil has n turns, the field produced at any point is n times as large as that produced by a single turn? [5]