CBSE 2020

Grade 10

Science

Series: JBB/1 **SET - 1**

Code No. 31/1/1

Candidates must write the code on the title page of the answer book.

Note:

(I) Please check that this paper contains 15 printed pages.

(II) Code number given on the right-hand side of the question paper should be written on the title page of the answer-book by the candidate.

(III) Please check that this question paper contains 30 questions.

(IV) **Please write down the Serial Number of the question in the answer-book before attempting it.**

(V) 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

SCIENCE

Time allowed: 3 hours **Maximum Marks: 80**

General Instructions:

Read the following instructions very carefully and strictly fallow them:

(i) Question paper comprises three sections - A, B and C.

There are 30 questions in the question paper. All questions are compulsory.

(ii) **Section A** - question no. 1 to 14 - all questions or part thereof are of one mark each. These questions comprise multiple choice questions (MCQ), very short answer (VSA), and Assertion-Reason type questions. Answer to these questions should be given on one word or one sentence.

(iii) **Section B** - question no. 15 to 24 are short answer type questions, carrying 3 marks each, Answer to these questions should not exceed 50 to 60 words.

(iv) **Section C** - question no. 25 to 30 are long answer type questions, carrying 5 marks each. Answer to these questions should not exceed 80 to 90 words.

(v) Answer should be brief and to the point. Also, the above-mentioned word limit be adhered to as far as possible.

(vi) There is no overall choice in the question paper. However, an internal choice has been provided in some questions in each Section. Only one of the choices in such questions have to be attempted.

(vii) In addition to this, separate instructions are given with each section and question, wherever necessary.

SECTION - A

1. Name acyclic unsaturated carbon compound. **[1]**

2. The change in magnetic field lines in a coil is the cause of induced electric current in it. Name the underlying phenomenon. **[1]**

Answer question numbers 3(a) to 3(d) and 4(a) to 4(d) on the basis of your understanding of the following paragraphs and the related studied concepts.

3. The growing size of the human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size. Reproduction is the process by which organisms increase their population. The process of sexual maturation for reproduction is gradual and takes place while general body growth is still going on. Some degree of sexual maturation does not necessarily mean that the mind or body is ready for sexual acts or for having and bringing up children. Various contraceptive devices are being used by human beings to control the size of population.

(a) List two common signs of sexual maturation in boys and girls. **[1]**

(b) What is the result of reckless female foeticide? **[1]**

(c) Which contraceptive method changes the hormonal balance of the body? **[1]**

(d) Write two factors that determine the size of a population. **[1]**

4. Human body is made up of five important components, of which water is the main component. Food as well as potable water are essential for every human being. The food is obtained from plants through agriculture. Pesticides are being used extensively for a high yield in the fields. These pesticides are absorbed by the plants from the soil along with water and minerals and from the water bodies these pesticides are taken up by the aquatic animals and plants. As these chemicals are not biodegradable, they get accumulated progressively at each trophic level. The maximum concentration of these chemicals gets accumulated in our bodies and greatly affects the health of our mind and body.

(a) Why is the maximum concentration of pesticides found in human beings? **[1]**

(b) Give one method which could be applied to reduce our intake of pesticides through food to some extent. **[1]**

(c) Various steps in a food chain represent: **[1]**

(a) Food web (b) Trophic level

(c) Ecosystem (d) Biomagnification **[1]**

(d) With regard to various food chains operating in an ecosystem, man is a:

(a) Consumer (b) Producer

(c) Producer and consumer (d) Producer and decomposer **[1]**

5. Calcium oxide reacts vigorously with water produce slaked lime.

$CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq)$

This reaction can be classified as:

(A) Combination reaction (B) Exothermic reaction

(C) Endothermic reaction (D) Oxidation reaction

Which of the following is a correct option?

(a) (A) and (C) (b) (C) and (D)

(c) (A), (C) and (D) (d) (A) and (B) **[1]**

OR

When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of a:

(a) Combination reaction (b) Displacement reaction

(c) Decomposition reaction (d) Double displacement reaction **[1]**

6. In a double displacement reaction such as the reaction between sodium sulphate solution and barium chloride solution:

(A) exchange of atoms takes place (B) exchange of ions takes place

(C) a precipitate is produced (D) an insoluble salt is produced

The correct option is:

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

(c) only (B) (d) (B), (C) and (D) **[1]**

7. Baking soda is a mixture of:

(a) Sodium carbonate and acetic acid

(b) Sodium carbonate and tartaric acid

(c) Sodium hydrogen carbonate and tartaric acid

(d) Sodium hydrogen carbonate and acetic acid **[1]**

8. The chemical formula for plaster of Paris is:

(a) $CaSO_4.2H_2O$ (b) $CaSO_4.H_2O$

(c) $CaSO_4.\frac{1}{2}H_2O$ (d) $2CaSO_4.H_2O$ **[1]**

9. The laws of reflection hold true for:

(a) plane mirrors only (b) concave mirrors only

(c) convex mirrors only (d) all reflecting surfaces **[1]**

OR

When an object is kept within the focus of a concave mirror, an enlarged image is formed behind the mirror. This image is:

(a) real (b) inverted

(c) virtual and inverted (d) virtual and erect **[1]**

10. At the time of short circuit, the electric current in the circuit:

(a) vary continuously (b) does not change

(c) reduces substantially (d) increases heavily **[1]**

OR

Two bulbs of 100 W and 40 W are connected in series. The current through the 100 W bulb is 1A. The current through the 40W bulb will be:

(a) 0.4A (b) 0.6A

(c) 0.8A (d) 1A **[1]**

12. Incomplete combustion of coal and petroleum:

(A) increases air pollution.

(B) increases efficiency of machines.

(C) reduces global warming.

(D) produce poisonous gases.

The correct option is:

(a) (A) and (B) (b) (A) and (D)

(c) (B) and (C) (d) (C)and (D) **[1]**

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.

13. Assertion (A): Esterification is a process in which a sweet-smelling substance is produced.

Reason (R): When esters react with sodium hydroxide an alcohol and sodium salt of carboxylic acid are obtained.

14. Assertion (A): In the process of nuclear fission, the amount of nuclear energy generated by the fission of an atom of uranium is so tremendous that it produces 10 million times the energy produced by the combustion of an atom of carbon from coal.

Reason (R): The nucleus of a heavy atom such as uranium, when bombarded with low energy neutrons, splits apart into lighter nuclei. The mass difference between the original nucleus and the product nuclei gets converted to tremendous energy. **[1]**

SECTION-B

15 1g pf copper powder was taken in a China dish and heated. What change takes place on heating? When hydrogen gas is passed over this heated substance, a visible change is seen in it. Give the chemical equations reactions, the name and the color of the products formed in each case. **[3]**

16. List the important products of the Chlor-alkali process. Write one important use of each. **[3]**

How is washing soda prepared from sodium carbonate? Give its chemical equation. State the type of this salt. Name the type of hardness of water which can be removed by it? **[3]**

17. 3 mL of ethanol is taken in a test tube and warmed gently in a water bath. A 5% solution of alkaline potassium permanganate is added first drop by drop to this solution, then in excess.

(i) How is 5% solution of $KMnO_4$ prepared?

(ii) State the role of alkaline potassium permanganate in this reaction. What happens on adding it in excess? **[3]**

(iii) Write chemical equation of this reaction **[3]**

18. A squirrel is in a scary situation. Its body has to prepare for either fighting or running away. State the immediate changes that take place in its body so that the squirrel is able to either fight or run? **[3]**

OR

Why is chemical communication better than electrical impulses as a means of communication between cells in a multi-cellular organism? **[3]**

19. Define the term pollination. Differentiate between self-pollination and cross pollination. What is the significance of pollination? **[3]**

20. What are homologous structures? Give an example. Is it necessary that homologous structures always have a common ancestor? Justify your answer. **[3]**

21. Why is Tyndall effect shown by colloidal particles? State four instances of observing the Tyndall effect. **[3]**

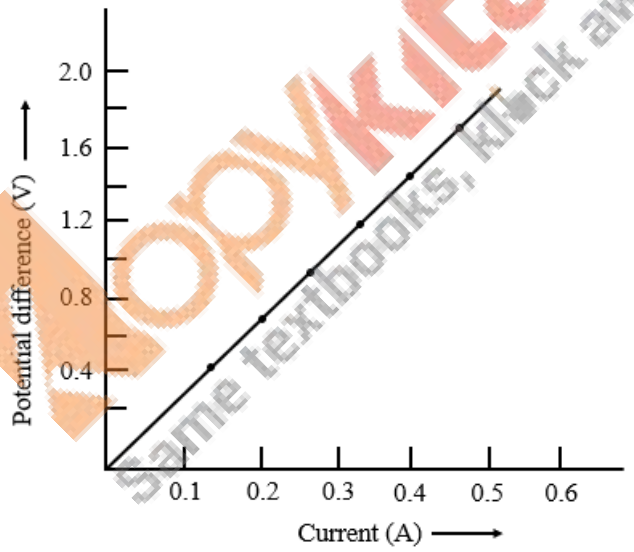
OR

Differentiate between a glass slab and a glass prism. What happens when a narrow beam of (i) a monochromatic light, and (ii) white light passes through

(a) glass slab and (b) glass prism? **[3]**

22. Draw a labelled diagram to show (i) reddish appearance of the sun at the sunrise or the sunset and (ii) white appearance of the sun at noon when it is overhead. **[3]**

23. A V-I graph for a nichrome wire is given below. What do you infer from this graph? Draw a labelled circuit diagram to obtain such a graph. **[3]**



24. (a) Write the mathematical expression for Joule's law of heating:

(b) Compute the heat generated while transferring 96000 coulomb of charge in two hours through a potential difference 40 V. **[3]**

SECTION-C

25. Carbon cannot reduce the oxides of sodium, magnesium and aluminium to their respective metals. Why? Where are these metals placed in the reactivity series? How are these metals obtained from their ores? Take an example to explain the process of extraction along with chemical equations. **[5]**

26. The position of certain elements in the Modem Periodic Table are shown below.

Group → / Period ↓	1	2	3 to 12	13	14	15	16	17	18
1	G								H
2	A			I			B		C
3		D			E				F

Using the above table answer the following questions giving reasons in each case:

(i) Which element will form only covalent compounds?

(ii) Which element is a non-metal with valency 2?

(iii) Which element is a metal with valency 2?

(iv) Out of H, C and F which has largest atomic size?

(v) To which family docs H, C and F belong? **[5]**

OR

Define atomic size. Give its unit of measurement. In the modern periodic table what trend is observed in the atomic radius in a group and a period and why is it so? **[5]**

27. (a) Why is there a difference in the rate of breathing between aquatic organisms and terrestrial organisms? Explain.

(b) Draw a diagram of human respiratory system and label - pharynx, trachea, lungs, diaphragm and alveolar sac on it. **[5]**

OR

(a) Name the organs that form the excretory system in human beings.

(b) Describe in brief how urine is produced in human body. **[5]**

28. (a) What is the law of dominance of traits? Explain with an example.

(b) Why are the traits acquired during the life time of an individual not inherited? Explain. **[5]**

29. Draw a ray diagram in each of the following cases to show the formation of image, when the object is placed:

(i) between optical centre and principal focus of a convex lens.

(ii) anywhere in front of a concave lens.

(iii) at 2F of a convex lens.

State the signs and values of magnifications in the above-mentioned cases (i) and (ii). **[5]**

OR

An object 4.0 cm in size, is placed 25.0 cm in front of a concave mirror of focal length 15.0 cm.

(i) At what distance from the mirror should a screen be placed in order to obtain a sharp image?

(ii) Find the size of the image.

(iii) Draw a ray diagram to show the formation of image in this case. **[5]**

30. (a) What is an electromagnet? List any two uses.

(b) Draw a labelled diagram to show how an electromagnet is made.

(c) State the purpose of soft iron core used in making an electromagnet.

(d) List two ways of increasing the strength of an electromagnet if the material of the electromagnet is fixed. **[5]**