Code No. 86

PRE-BOARD EXAMINATION-2 (JANUARY– 2020)

CLASS: X **SCIENCE** **Time: 3 hours**

MAX. MARKS: 80

General Instructions:

- ***(i)*** *The question paper comprises three sections –A, B and C. Attempt all the sections.*
- ***(ii)*** *All questions are compulsory.*
- ***(iii)*** *Internal choice is given in each section.*
- ***(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 80-90 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

1. What is the formula of Methanol? (1)

2. Name two metals in the activity series which do not react with Oxygen (1)

3. Answer the questions on the basis of your understanding of the following paragraph and the related studied concepts. (4)

   Solar energy has been used since prehistoric time but in a most primitive manner. Before 1970, some research and development was carried out in a few countries to use solar energy more efficiently, but most of the work was only of academic interest. With the sharp rise in oil prices in 1970's, several countries initiated extensive research and development programmes to harness solar energy. To make use of the solar energy for practical purposes, we have to devise methods to collect it. This is achieved by: collecting solar energy in the form of heat and using this heat as such. There are certain devices based on this principle. These devices collect solar energy in the form of heat for a period of 5 to 7 hours during a sunny day.

   (a) Write two uses of solar cell panel
   (b) What kind of mirror-concave, convex or plane-would be best suited for use in a solar cooker?
   (c) What are the two characteristics of a good fuel?
   (d) Silicon is used to fabricate solar cells. Write one advantage of using silicon in a solar cell.

4. The digestion of food in stomach is carried out by the **A** present in the wall of the stomach. **A** releases **B, C,** and **D.** An acidic medium is created by **B** which facilitates the action of **C.** The lining of the stomach is protected from the action of acids by **D.** What does **A, B, C,** and **D** represent? (4)

5. The cells which enables us to distinguish different colours are (1)
   (i) Cone shaped
   (ii) Rod shaped
   (iii) Both rod and cone shaped
   (iv) None of these

OR

The phenomenon of light responsible for the working of the human eye is
   (i) Reflection
   (ii) Refraction
   (iii) Power of accommodation
   (iv) Persistence of vision

6. 100 J of heat are produced each second in a 4 Ω resistance. Find the potential difference across the resistor. (1)
   (i) 12V
   (ii) 20 V
   (iii) 40 V
   (iv) 24 V

7. Which uses more energy, a 250 W TV set in 1 h, or a 1200 W toaster in 10 minutes? (1)
   (i) Toaster
   (ii) Television
   (iii) Both toaster and television
   (iv) Cannot say

8. Which part of Amoeba undergoes the initial change during binary fission? (1)
   a) Cytoplasm
   b) Nucleus
   c) Pseudopodia
   d) Vacuole

OR

Which one of the following fungi does not reproduce by spore formation?
   a) Rhizopus
   b) Penicillium
   c) Yeast
   d) Mucor

9. Which one of the following greenhouse gases is a contributor due to incomplete combustion of coal and petroleum? (1)
   (i) Oxides of nitrogen
   (ii) Methane
   (iii) Carbon monoxide
   (iv) Carbon dioxide

10. You are given the following chemical equation: (1)

   $Mg(s) + CuO(s) \rightarrow MgO(s) + Cu(s)$

   This equation represents:

   (a) Decomposition reaction as well as displacement reaction
   (b) Combination reaction as well as double displacement reaction
   (c) Redox reaction as well as displacement reaction
   (d) Double displacement reaction as well as redox reaction

11. The daffodil plants grow best in a soil having a pH range of 6.0 to 6.5. If the soil in a garden has a pH of 4.5, which substance needs to be added to the soil in order to grow daffodils? (1)
(a) salt
(b) lime
(c) sand
(d) compost

12. On moving from left to right in a period of a periodic table, the atomic number of elements increases. What happens to the size of atoms of elements on moving from left to right in a period? (1)
(a) increases
(b) decreases
(c) remains same
(d) first increases then decreases

OR

The elements A, B, C, D and E have atomic numbers 9,11,17,12, and 13 respectively. The pair of elements which belongs to the same group of the periodic table are:
(a) A and B
(b) B and D
(c) A and C
(d) D and E

13. In the following questions, the Assertion and Reason have been put forward. Read the statements carefully and choose the correct alternative from the following: (1)
a) Both the Assertion and Reason are correct and the Reason is the correct explanation of the Assertion.
b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.
c) Assertion is true but the Reason is false.
d) The statement of the Assertion is false but the Reason is true.

Assertion: Zinc is used in the galvanization of iron
Reason: Its coating on iron articles increasing the life of it by protecting it from rusting.

14. Assertion: When a pencil is partly immersed in water and held obliquely to the surface, the pencil appears to bend at the water surface (1)

Reason: The apparent bending of the pencil is due to the refraction of light when it passes from water to air.

(i) Both the Assertion and Reason are correct and the Reason is the correct explanation of the Assertion.
(ii) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.
(iii) Assertion is true but the Reason is false.
(iv) The statement of the Assertion is false but the Reason is true.

SECTION B

15. (a) What happens when an aqueous solution of sodium sulphate reacts with an aqueous solution of barium chloride? (3)
(b) Write the balanced chemical equation for the reaction which takes place
(c) Give the type of chemical reaction which occurs.

16. (a) Name a metal compound which has detergent properties (cleansing properties). (3)
(b) Name one compound of calcium which is used for removing colour of a coloured cloth.
(c) State a peculiar (or remarkable) property of Plater of Paris.

OR

Consider the following salts: Na_2CO_3, NaCl, NH_4Cl, CH_3COONa, K_2SO_4, $(NH_4)_2SO_4$
Which of these salts will give:
(a) acidic solutions?
(b) neutral solutions?
(c) basic solutions (or alkaline solutions)?

17. An element X (2,8,2) combines separately with NO_3^- and SO_4^{2-}, PO_4^{2-} radicals. (3)

(a) Write the formulae of the three compounds so formed.
(b) To which group of the periodic table does the element 'X' belong?
(c) Will it form co-valent or ionic compound? Why?

18 Give reasons: (3)
a) During one cardiac cycle blood goes only once through the heart of fishes.
b) Respiratory surfaces are moist and richly supplied with blood.
c) Plants have low energy needs compared to animals.

OR

Write the function of the following:
a) Pulmonary vein
b) Vena cava
c) Aorta

19. Questions 4i, 4ii, and 4iii consist of two statements, assertion (A) and reason (R). Answer these questions selecting the appropriate option from a to d. (3)

a) Both A and R are true, and R is the correct explanation for A.
b) Both A and R are true, and R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

i. (A) Biological magnification is the process in which harmful chemicals enter the food chain and get accumulated progressively at each trophic level.
(R) Use of non-biodegradable pesticides leads to biomagnification.

ii. (A) Bacteria and fungi breakdown dead remains and waste products of organisms into simple inorganic substances that go into the soil, water, or air.
(R) Use of fertilizers change the chemistry of soil and kills useful microbes.

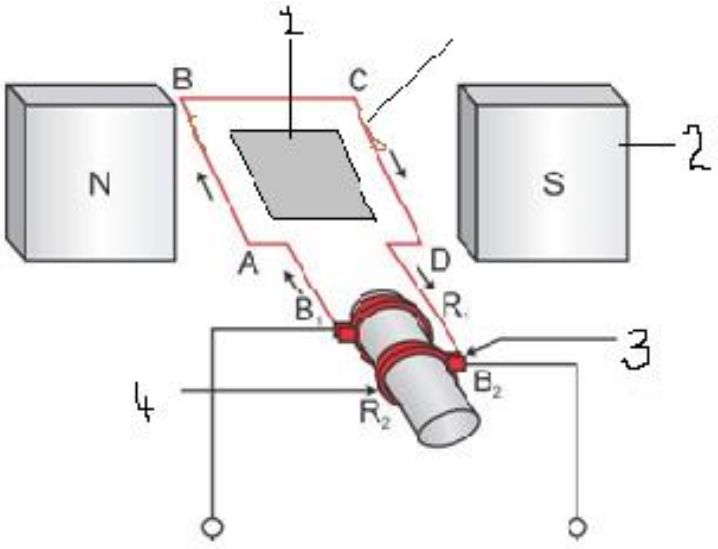
iii. (A) At each trophic level in a food chain a large portion of the energy is utilized for the maintenance of organisms at that trophic level and energy is also lost as heat.
(R) Organisms at each trophic level pass on less energy to the next trophic levels than they receive.

20. a) What are the hormones secreted by Pancreas? Give the functions of each of these hormones. (3)

b) How is the amount of hormone released regulated?

21. a) What is biodiversity hot spot? (3)
b) Who are the stake holders of forests?
c) Why should we conserve forests and wildlife?

22. The below figure shows the parts of an AC generator.(i) Label the parts which are numbered (ii) Name and state the principle of an AC generator. (3)



23. Define SI unit of power. A doctor has prescribed a corrective lens of power + 1.5 D. Find the focal length of the lens. Is the prescribed diverging or converging? (3)

24. The lower half of a convex lens is covered with a black paper, With reference to this answer the following questions: (3)

(i) Will this lens produce a complete image of the object?
(ii) Justify your answer with the help of a necessary ray diagram.

OR

(i) What is visible spectrum?
(ii) Why is red used as the stopping light at traffic signals?
(iii) Two triangular glass prism are kept together connected through their rectangular side. A light beam is passed through one side of the combination. Will there be any dispersion? Justify your answer.

SECTION C

25. Give reason (s): (5)
(a) Aluminium sheets do not corrode easily.
(b) Calcium starts float when added to water.
(c) Copper vessel coated with a green coating in rainy season.
(d) Electrical wires are coated with plastic
(e) Most of the metals do not give hydrogen while reacting with nitric acid

OR

(a) A substance X, an oxide of a metal, is used extensively in the cement industry. This element is found in our bones also. On treatment with water if forms a solution which turns red litmus blue. Identify X and also write the chemical reaction involved.
(b) Choose a metal from the following metals which reacts only with hot water: Sodium, magnesium, iron. Mention the products formed during the reaction.

26. (a) What are hydrocarbons? (5)
(b) Write the structural difference between saturated and unsaturated hydrocarbons.
(c) Why is hard water not suitable for washing clothes with soap?
(d) Why does micelle formation take place when soap is added to water?
(e) What is saponification?

27. a) What happens when pollen grains fall on stigma? (5)
b) Draw a neat and well labeled diagram showing germination of pollen grains on stigma.
c) What are the post fertilization changes in a flower?

28. a) What are variations? (5)
b) Explain the various ways by which individuals with a particular trait increase in the population.

OR

Pure bred tall pea plants are crossed with pure bred dwarf pea plants. The plants obtained in F_1 generation are then self- pollinated to produce F_2 generation pea plants.

a) What is the genotype and phenotype of F_1 hybrids?
b) What is the ratio of homozygous dominant, homozygous recessive, and heterozygous plants in F_2 generation?
c) What is the phenotypic ratio of F_2 generation?
d) What are homozygous and heterozygous plants?
e) What are dominant and recessive traits?

29. (i) Write two applications of heating effect of current. What is the commercial unit of electric energy? (5)

(ii) Two lamps, one rated 100 W at 220 V, and the other 60 W at 220 V, are connected in parallel to the electric main supply. What current is drawn from the line if the supply voltage is 220 V?

30. (i) In the case of a concave mirror draw a ray diagram to show that the image formed is same size as that of the object. Also mention the characteristics of the image formed in this case. (5)

(ii) Write two uses of a concave mirror.

OR

(i) On entering in a medium from air, the speed of light becomes half of its value in air. Find the refractive index of that medium with respect to air?

(ii) A glass slab made of a material of refractive index n_1 is kept in a medium of refractive index n_2. A light ray is incident on the slab. Draw the path of the rays of light emerging from the glass slab, if (a) $n_1 > n_2$ (b) $n_1 = n_2$ (c) $n_1 < n_2$