CARMEL CONVENT SCHOOL, CHANDIGAIRH
PRE-BOARD EVALUATION 2024-25
SCIENCE

Class: X **Time: 3 hrs**
Date: 13.01.2025 **MM: 80**

General Instructions:
Read the following instructions carefully:
(i) This question paper contains 39 questions. All questions are compulsory.
(ii) This question paper is divided into five sections – Sections A, B, C, D and E.
(iii) In Section A – Questions no. 1 to 20 are Multiple Choice type questions. Each question carries 1 mark.
(iv) In Section B – Questions no. 21 to 26 are Very Short Answer type questions. Each question carries 2 marks. Answers to these questions should be in the range of 30 to 50 words.
(v) In Section C – Questions no. 27 to 33 are Short Answer type questions. Each question carries 3 marks. Answers to these questions should be in the range of 50 to 80 words.
(vi) In Section D – Questions no. 34 and 36 are Long Answer type questions. Each question carries 5 marks. Answers to these questions should be in the range of 80 to 120 words.
(vii) In Section E – Questions no. 37 to 39 are of 3 source-based/case-based units of assessment carrying 4 marks each with sub-parts.
(viii) There is no overall choice. However, an internal choice has been provided in some sections. Only one of the alternatives has to be attempted in such questions.

SECTION A

1. In order to balance the following chemical equation, the values of a, b, c and d respectively are.
$$aPb(NO3)2 \rightarrow bPbO + cNO2 + dO2$$
   a. 2,4,2,1
   b. 2,2,4,1
   c. 2,2,3,4
   d. 2,2,1

2. Sodium hydroxide reacts with zinc granules to form a colourless and odourless glass. The test for the gas evolved is:
   a. It burns lime water milky.
   b. It burns with a pop sound.
   c. It burns with a dazzling white flame.
   d. It burns with a pungent odour.

3. When phenolphthalein indicator is added to the solution of calcium and water, the solution.
   a. Turns Pink
   b. Turns Blue
   c. Turns Yellow
   d. Becomes colourless

4. Select a group of unsaturated hydrocarbons from the following:
   a. Ethane, propane, butane
   b. Ethyne, butene, cyclohexane
   c. Ethene, propene, butyne
   d. Methane, ethene, propyne

5. In the structure of cyclohexane (C6H12) there are:
   a. Six single bonds, four double bonds and two triple bonds
   b. Six single bonds, two double bonds and one triple bond
   c. Eight single bonds and five double bonds
   d. Eighteen single bonds only

6. The reactivity of metals based on their reaction with water is as follows
   a. Na < K < Ca < Al
   b. K >Na > Ca > Al
   c. Na > K > Zn > Ca
   d. Al > Na > Ca > K

7. Which one of the following is an example of an endothermic process?
   a. Digestion of food in human body
   b. Formation of slaked lime
   c. Decomposition of vegetable matter into compost
   d. Decomposition of silver bromide into silver and bromine

8. Select a pair of plant hormones from the following:
   a. Cytokinin and Insulin
   b. Gibberellin and Adrenaline
   c. Abscisic acid and Adrenaline
   d. Auxin and Abscisic acid

9. Fruits and seeds are formed respectively
   a. from ovary and ovule before fertilization.
   b. from ovary and ovule after fertilization
   c. from ovary and ovule before pollination.
   d. from ovary and ovule after pollination

10. Reflex arcs have evolved in animals because
   a. Animals have a complex neuron network needed for thinking
   b. Presence of true thought processes
   c. Animals don't have nervous tissue
   d. The thinking process of the brain is not fast enough

11. The direction of magnetic field produced around a current carrying straight conductor is determined by using:
   a. Fleming's left-hand rule
   b. Left hand thumb rule
   c. Right hand thumb rule
   d. Fleming's right-hand rule

12. In a cross between two tall pea plants, a few dwarf pea plants were also obtained in F1 generation. It is possible only if the gene combination of the parental plants is:
   i) TT and Tt
   ii)TT and tt
   iii)Tt and tt
   iv) Tt and Tt
   a. i) and ii)
   b. ii) & iii)
   c. i) & iv)
   d. iii) & iv)

13. When a steady current flow through a long straight solenoid it behaves as a bar magnet having a north and a south pole. The strength of the magnetic field inside the solenoid is:
   a. zero everywhere.
   b. uniform everywhere.
   c. maximum at the ends and minimum at the centre.
   d. minimum at the ends and maximum at the centre.

14. You have four resistance wires of the same material. Select the wire which will offer the least resistance to the flow of current in an electric circuit:
   a. Length 2l and diameter 2d
   b. Length l and diameter d
   c. Length l/2 and diameter d/2
   d. Length l/4 and diameter d/4

15. The opening and closing of stomatal pore in the leaves of a plant is due to:
   a. diffusion of carbon dioxide in and out of the guard cells.
   b. movement of water in and out of the guard cells.
   c. high pressure of gases inside the guard cells.

d. stimulus of light in the guard cells.

16. The resistance of a resistor is increased four times its initial value. If other parameters (current and time) remain unchanged, the percentage change in the amount of heat produced in the resistor would be:

a. 100%
b. 200%
c. 300%
d. 400%

Questions number 17 to 20 are Assertion (A) and Reason (R) based questions. Two statements are given — one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer from the codes (A), (B), (C) and (D) as given below.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

17. **Assertion (A)** : Magnetic field lines never intersect each other.
Reason (R) : If two field lines intersect each other at a point then it would mean that at the point of intersection the resultant field has two directions, which is not possible.

18. **Assertion (A):** Cellular DNA is the information source for making proteins in the cell
Reason (R): A section of DNA that provides information for one protein is called the gamete.

19. **Assertion (A)**: In humans, the inner lining of the small intestine has finger-like projections called villi which are richly supplied with blood vessels.
Reason (R) : Villi increases the surface area for the absorption of digested food.

20. **Assertion (A)** : Calcium oxide is an amphoteric oxide.
Reason (R) : Metal oxides which react with both acids as well as bases to form salt and water are called amphoteric oxides.

SECTION B

21.
a. How is Ozone formed in the atmosphere?
b. Which substance is mainly responsible for ozone depletion?
c. Show it with the help of equations. 2

22. (a) Write the chemical name and molecular formula of Plaster of Paris. Why should it be stored in a moisture proof container?

OR

(b) What is a neutralisation reaction? Write the chemical equation for a neutralisation reaction and write the name of the salt produced. 2

23. Which gland and enzyme/chemical in the human body is responsible for
a. Emulsification of fats?
b. Facilitates the action of pepsin in the stomach? 2

24. Name one plant hormone each responsible for 2

a. Wilting of leaves
b. phototropism
c. promotion of cell division
d. Inhibition of growth

25. Why is Fragmentation not possible in complex organisms?

OR

Why is regeneration not considered to be a mode of reproduction? 2

26. The far point of a defective eye is nearer than infinity.

(i) Identify the defect of vision.
(ii) List two possible causes responsible for this defect.
(iii) Name the type of lens (converging/diverging) used for the correction of this defect.

OR

"The colour of the clear sky from the earth appears blue but the sky appears dark to the passengers flying at very high altitudes." Explain. 2

SECTION C

27. Consider the following salts:

(i) XCl (ii) NH4Y (iii) ZCO3

Answer the following questions giving reason in each case.

(a) If 'X' is sodium, what is the pH of XCl?
(b) If 'Y' is sulphate, what colour would the aqueous solution of NH4Y give when a few drops of universal indicator are added to it?
(c) If 'Z' is calcium, what would be the change in colour in blue litmus paper when a drop of ZCO3 is poured on it? 3

28. In the electrolysis of acidulated water

(a) Name the gas collected at the (i) cathode and (ii) anode.
(b) Why is the volume of one gas collected at one electrode two times the gas collected at the other electrode?
(c) Write the method of testing of any one of the gases evolved in this case. 3

29.

a. List any two characteristics of lungs which make them an efficient respiratory system.
b. Name the part of human respiratory system:
(i) where air is filtered by fine hair and mucous lining.
(ii) which separates the chest cavity from abdominal cavity.
(iii) which has balloon-like structures where exchange of gases takes place.
(iv) two large air passages which connect trachea to lungs. 3

OR

a. In the human excretory system name the following parts:
(i) in which urine is produced
(ii) where urine is stored

(iii) which connects (1) and (2) mentioned above

(iv) which provides passage for urine to pass

b. List two factors on which the amount of water reabsorbed along the tubular part of nephron depends. 3

30.

a. Why is the concentration of harmful chemicals found to be maximum in human beings?

b. Why do the food chains not have more than 4 or 5 trophic levels? 3

31. A student has focussed the image of an object of height 5 cm on a screen using a convex lens of focal length 20 cm. If the object distance is 30 cm, find, using lens formula, the (i) image distance and (ii) height of the image produced.

OR

Define power of a lens. The focal length of a lens is + 25 cm. Determine its nature (converging/diverging) and calculate its power. If an object is placed at a distance of 50 cm from the optical centre of this lens, list two properties of the image formed in this case. 3

32. Define the term dispersion of white light. State the colour of light which bends (i) the least, (ii) the most, while passing through a glass prism. Also, state the cause of dispersion of a narrow beam of white light when it passes through a prism.

OR

When and where does a rainbow appear in the sky? Write sequence-wise the phenomena of light responsible for the formation of a rainbow. List two essential conditions for observing a rainbow. 3

33.

a. How is the type of current used in household supply different from the current given by a battery of dry cells?

b. Which one of the two currents mentioned above in (a) is considered to be more advantageous for the long-distance transmission of electric power and why?

c. How does the electric fuse prevent the electric circuit and the appliances from possible damage due to short circuiting? 3

SECTION D

34. (a) (i) Write the name and formula of (1) an alcohol and (2) a carboxylic acid having two carbon atoms.

(ii) If alcohol is X and carboxylic acid is Y, then

(1) what happens when X and Y react in the presence of an acid catalyst? Write a chemical equation for the reaction and also the name of the reaction.

(2) what happens when X is heated in excess of conc. sulphuric acid at 443 K? Write the role of conc. sulphuric acid in the reaction. 5

35. Give a term for the following:

a. A temporary disc shaped organ that forms in the uterus during pregnancy

b. Ways that have been devised to avoid pregnancy.

c. Development of the embryo into a seedling under appropriate conditions

d. Future shoot

e. The attachment of the fertilized egg to the uterine lining

OR

a. What are the changes that take place in the uterus of human female if

(i) Fertilization takes place?

(ii) Fertilization does not take place?

b. Differentiate between the human male and the female germ cells. 5

36. (a) List two factors on which the resistance of a conductor in the shape of a straight cylinder depends. Write the relation between resistance (R) and the resistivity (r) of the material of the conductor. Use this relation to obtain the SI unit of resistivity.

(b) Resistance of a metal wire of length 1 m is 40 Ω. If the area of cross-section of the wire is $6{\cdot}5 \times 10^{-8}$ m^2, find the resistivity of the material of the wire. 5

SECTION E

Note: Q. No. 37 to 39 are source based/case-based questions with 3 subparts. Internal choice is provided in one of these subparts.

37. Alloying is a very good method of improving the properties of metals. Most of the metallic objects (cooking utensils, ornaments, coins, guns, etc.) are made up of alloys. It is because pure metals are generally very soft and have low melting points. For example, iron is the most widely used metal, but it is never used in its pure form to make cooking pans because it is very soft in its purest form, it is corrosive and easily stretches when hot.

(a) What is an alloy? 1

(b) Write the constituents of bronze. 1

(c) (i) How is stainless steel made? List two properties in which it differs from iron. 1,2

OR

(c) (ii) What is solder? Write its main use stating the property of solder which makes it suitable for this specific use. 2 ,1

38. In rabbits, gray hair is dominant to white hair. Also, in rabbits, black eyes are dominant to red eyes. A male rabbit with the genotype GGbb is crossed with a female rabbit with the genotype ggBb.

a. What are the phenotypes (descriptions) of rabbits that have the following genotypes?

i. Ggbb ii. Ggbb ggbb

iii. ggBB iv. GgBb 2

b. Determine the phenotypes and proportions in the offspring of the cross. 2

39. Under the guidance of his teacher on a sunny day, a student took a concave mirror of large aperture in his hand and directed its reflecting surface towards the sun. After that he directed the light reflected by the concave mirror on a thick sheet of white paper held close to the mirror. He observed a bright circular spot of light on the paper. Then he moved the mirror back and forth gradually until he got the brightest and smallest spot of light on the paper. The teacher said this sharp spot of light is, in fact, the real and inverted image of the sun and the distance between the mirror and this image is the focal length of this concave mirror.

a. Define the term principal focus of a concave mirror. 1

b. If the distance between the pole and focus of a concave mirror is 12 cm, what is the radius of curvature of the mirror? 1

c. List two properties of the image formed due to a concave mirror of focal length 15 cm in each of the following cases:

(i) object distance 20 cm

(ii) object distance 10 cm

OR

(c) (ii) A 3 cm long candle flame is placed in front of a concave mirror. If the distance between the pole and the candle flame is 40 cm and the image is formed at the same place where the candle flame is located, find the

(i) focal length of the mirror, and

(ii) magnification of the image formed with sign as per the New Cartesian Sign Convention. 2

END