

PRE BOARD EXAM -2 (2023-24)
CLASS 10 SCIENCE (086)

Max. Marks: 80

Time Allowed: 3 hours

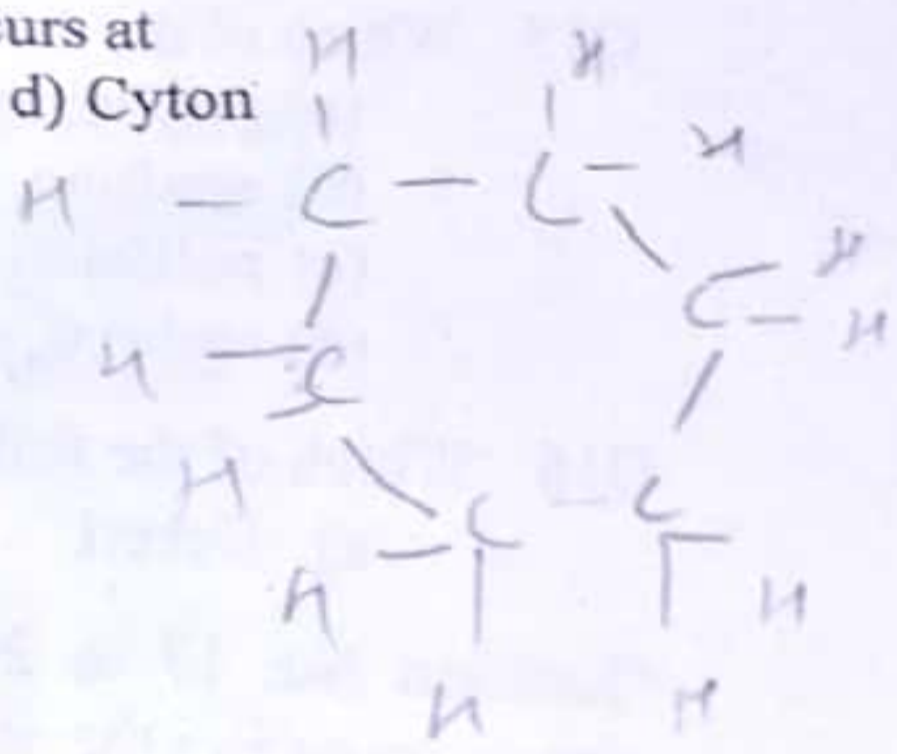
General Instructions:

- i. This question paper consists of 39 questions in 5 sections
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION A

Select and write the most appropriate option out of the four options given for each of the questions 1 – 20. There is no negative mark for an incorrect response.

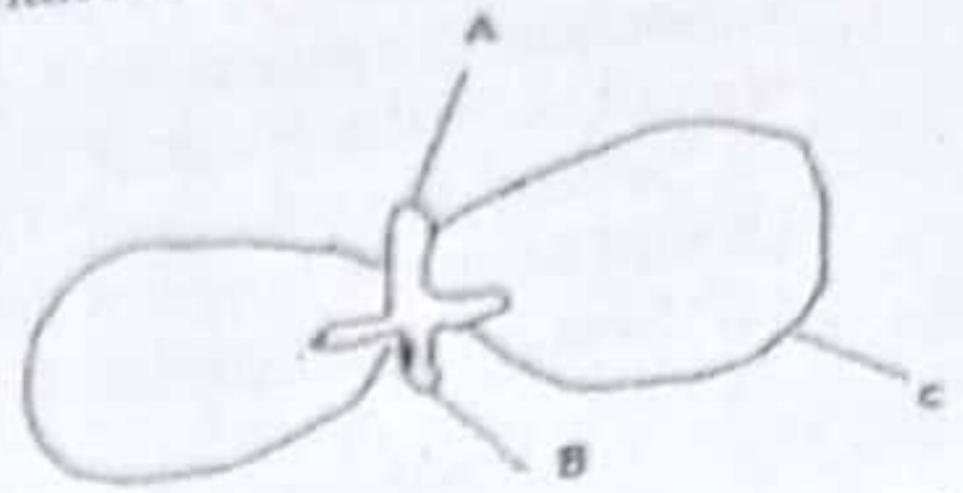
- Q1 What is the relationship between the compounds given below:
(i) CH_3COCH_3 (ii) $\text{CH}_3\text{CH}_2\text{CHO}$
a) Isotopes b) Isobars c) Isomers d) Homologous
- Q2 In living organisms during respiration which of the following products are NOT formed if oxygen is not available?
a) Carbon dioxide and water c) Carbon dioxide and lactic acid
b) Carbon dioxide and alcohol d) Lactic acid and alcohol
- Q3 In a neuron, conversion of electrical signal to a chemical signal occurs at
a) Axon b) Synapse c) Dendrite end d) Cyton
- Q4 Cyclohexane with the molecular formula C_6H_{12} Has
a) 12 covalent bonds c) 16 covalent bonds
b) 8 covalent bonds d) 18 covalent bonds
- Q5 Magnification produced by a rear view mirror fitted in vehicles
(a) Is less than one
(b) Is more than one
(c) It is equal to one
(d) It can be more or less than one depending on the position of the object in front of it.
- Q6 The molecular mass of a carbohydrate is 30U. What will be the mass of the consecutive higher homologue?
a) 44U b) 42U c) 48U d) 56U
- Q7 Iron filings are added to an aqueous solution of copper sulphate. After some time, on observation, it was found that the colour of the solution had changed from
a) Blue to pale green c) Blue to colourless
b) Blue to dark green d) Blue to reddish brown
- Q8 The Chromosomal set up of human female can be represented by
a) 44-XX b) 44-XY c) 22-XX d) 22-XY
- Q9 Choose the incorrect statement
a) Solar energy is eco-friendly c) Diesel is eco-friendly
b) Kerosene is eco-friendly d) LPG is eco-friendly



- Q10 In the redox reaction
 $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$
 a) MnO_2 is reduced to MnCl_2 and HCl is reduced to H_2O
 b) MnO_2 is reduced to MnCl_2 and HCl is oxidized to Cl_2
 c) MnO_2 is oxidised to MnCl_2 and HCl is reduced to H_2O
 d) MnO_2 is oxidised to MnCl_2 and HCl is reduced to Cl_2

- Q11 Sodium hydrogen carbonate is used to distinguish
 a) Ethanol and methanol
 b) Ethanol and ethane
 c) Ethene and ethyne
 d) Ethanol and ethanoic acid

- Q12 In following diagram identify the parts A, B and C sequentially
 (a) cotyledon, plumule and radicle
 (b) plumule, radicle and cotyledon
 (c) plumule, cotyledon and radicle
 (d) radicle, cotyledon and plumule



- Q13 Which of the following will give a colourless gas that burns with pop sound on reaction with dilute HCl
 a) solid sodium carbonate
 b) zinc metal
 c) Sodium hydroxide
 d) Sodium bicarbonate

- Q14 Two resistors of resistance $2\ \Omega$ and $4\ \Omega$, when connected to a battery, will have
 (a) the same potential difference across them when connected in series
 (b) same current flowing through them when connected in series
 (c) same current flowing through them when connected in parallel
 (d) different potential difference across them when connected in parallel

- Q15 Which of the following is the correct sequence of events of sexual reproduction in a flower?
 (a) pollination, fertilisation, seedling, embryo
 (b) seedling, embryo, fertilisation, pollination
 (c) pollination, fertilisation, embryo, seedling
 (d) embryo, seedling, pollination, fertilisation

- Q16 Which of the following is not an example of an ecosystem?
 a) Desert
 b) Garden
 c) Fish in a bowl
 d) Ocean bed

Question No. 17 to 20 consist of two statements - Assertion (A) and Reason (R). Answer these options selecting the appropriate option given below :

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

- Q17 Assertion (A): during electrolysis of concentrated aqueous solution of sodium chloride hydrogen is produced at anode and chlorine gas is produced at cathode.
 Reason (R): Ions get attracted to oppositely charged electrodes

- Q18 Assertion (A): Dominant allele is an allele whose phenotype expresses even in the presence of another allele of that gene.
 Reason (R) : It is represented by a capital letter, e.g. T

- Q19 Assertion (A): When electric current is passed through a copper wire, magnetic needle kept near to wire shows deflection.
 Reason (R): the electric current through copper wire has produced magnetic field.

- Q20 Assertion (A): Hemoglobin is not the respiratory pigment in human beings.
Reason (R): It transports oxygen in the human body.

SECTION B

Question No. 21 to 26 are very short answer questions

- Q21 State reasons for the following
- Metals are good conductors of heat and electricity
 - Addition of silver to pure gold for making ornaments

OR

When a copper wire is left in silver nitrate solution, it is observed that the solution turns bluish green

- Explain this observation
 - Write the balanced equation to represent the change taking place
- Q22 Explain briefly how we receive a stimulus from environment and show response towards it with a diagram.
- Q23 Name the following
- The three-carbon molecule that is formed due to breakdown of glucose during respiration.
 - Nitrogenous waste that is removed from the blood in our kidneys.
- Q24 How will you use two identical glass prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw and label the ray diagram.
- Q25 A spherical mirror produces a magnification of -1 on a screen placed at a distance of 50cm from the mirror.
- Write the type of the mirror.
 - Find the distance of the image from the object.

OR

What is lateral displacement of light? Illustrate this with the help of a diagram.

- Q26 In each of the following situations, what happens to the rate of photosynthesis
- | | |
|-----------------------------|-------------------------------|
| i) Cloudy days | iii) Stomata get blocked |
| ii) No rainfall in the area | iv) Good manuring in the area |

SECTION C

Question No. 27 to 33 are short answer questions

- Q27 What is solenoid? Draw the pattern of magnetic field lines of
- a current carrying solenoid and
 - a bar magnet.
- Q28 a) Solution A Gives pink colour when a drop of phenolphthalein indicator is added to it. Solution B gives red colour when drop of methyl orange is added to it. What type of solutions are A and B and which of these solutions A or B will have higher pH value?
- b) Name one salt whose Solution has pH more than 7 and one salt with pH less than 7
- Q29 a) Define ten percent law.
- b) In the following food chain, only 2J of energy was available to the peacock. How much energy would have been present in Grass? Justify your answer.
Grass " Grass Hopper " Frog " Snake " Peacock.
- Q30 (A) Write the hormones produced by following.
- | | | | |
|--------------------|-----------|----------|-------------------|
| a) Pituitary gland | b) Testis | c) Ovary | d) Adrenal glands |
|--------------------|-----------|----------|-------------------|
- (B) Differentiate between nervous and hormonal control.
- OR
- (A) Draw a diagram of cross-sectional view of human brain and label the following (2)

- a) Largest part of forebrain
- b) Part that controls salivation and vomiting
- c) Part responsible for voluntary actions
- d) A fluid that protects the brain

(B) With a suitable example explain the terms phototropism and geotropism. (1)

Q31 (i) Why is it necessary to earth the metallic casing of electric appliance?
 (ii) What do you mean by the term short circuiting?
 (iii) Write any two advantages of Alternating Current over Direct Current.

Q32 A small amount of quick lime is added to water in a beaker
 a) Name and define the type of reaction that has taken place
 b) Write balanced chemical equation for the above reaction. Write the chemical name of the product obtained
 c) What do you observe when you see the reaction

Q33 (i) Define the term refractive index.
 (ii) Refractive index of diamond with respect to glass is 1.6 and absolute refractive index of glass is 1.5. Find out the absolute refractive index of a diamond.

SECTION D

Question No. 34 to 36 are long answer questions.

Q34 A metal 'M' which is one of the best conductor of heat and electricity used in making electric wires is found in nature as sulphide ore M_2S ?

i) Name the metal 'M'

ii) Which process will be suitable for extraction of this metal M from its ore M_2S ? Write the balanced chemical reactions involved in the process of 'extraction'

iii) With the help of a labelled diagram, explain the process of electrolytic refining of the metal.

OR

Give reasons for the following:

- i) Silver and copper lose their shine when they are exposed to air. Name the substance formed on their surface in each case.
- ii) Tarnished copper vessels are cleaned with tamarind juice.
- iii) Aluminium is more reactive than iron yet there is less corrosion of aluminium as compared to iron when both are exposed to air.
- iv) Metals high up in the Reactivity series cannot be reduced by chemical reduction
- v) Melting point of NaCl is high

Q35 A green stemmed rose plant denoted by GG and a brown stemmed rose plant denoted by gg are allowed to undergo a cross with each other.

(a) List your observations regarding:

(i) Colour of stem in their F₁ progeny

(ii) Percentage of brown stemmed plants in F₂ progeny if plants are self-pollinated.

(iii) Ratio of GG and Gg in the F₂ progeny.

(b) Why is the F₁ progeny always of tall plants when a tall plant is crossed with a short pea plant?

OR

(a) What is meant by traits of an individual?

(b) Explain inherited and acquired traits with suitable examples.

(c) List any two contrasting characters other than of pea plants that Mendel used in his experiment.

- Q36 (a) Two lamps, one rated 100 W at 220 V and the other 200 W at 220 V are connected (i) in series and (ii) in parallel to the electric main supply of 220 V. Find the current drawn in each case.
(b) State the law that explains the heating effect of current with respect to the measurable properties in an electrical circuit.

OR

Draw a schematic diagram of a circuit consisting of a battery of 3 cells of 2V each, a combination of three resistors of $10\ \Omega$, $20\ \Omega$ and $30\ \Omega$ connected in parallel, a plug key and an ammeter, all connected in series. Use this circuit to find the value of the following:

(a) Current through each resistor

(b) Total current in the circuit

(c) Total effective resistance of the circuit.

SECTION E

Question No. 37 to 39 are case-based/data-based questions with sub-parts. Internal choice is provided in one of these sub-parts

- Q37 Based on the hints given below, answer the questions following them.

HINTS:

1. Substance 'C' is used as a preservative.
2. 'C' has two carbon atoms; 'C' is obtained by the reaction of 'A' in presence of alkaline Potassium permanganate followed by acidification.
3. Misuse of 'A' in industries is prevented by adding Methanol, Benzene, and pyridine to 'A'.
4. 'F' is formed on heating 'A' in presence of conc Sulphuric acid.
5. 'F' reacts with Hydrogen gas in presence of Nickel and Palladium catalyst.

QUESTIONS

(a) Give the IUPAC names of A and F

(b) Illustrate with the help of chemical equations the changes taking place.
($A \rightarrow C$ and $A \rightarrow F$)

OR

Name the chemical reactions which occur in steps 2 and 5. Identify the compounds formed in these steps if 'A' is replaced with its next homologue.

- Q38 The reproductive parts of angiosperms are located in the flower. You have already studied the different parts of a flower – sepals, petals, stamens and pistil. Stamens and pistil are the reproductive parts of a flower which contain the germ-cells. The flower may be unisexual (papaya, watermelon) when it contains either stamens or pistil or bisexual (Hibiscus, mustard) when it contains both stamens and pistil.

- a) What is the male reproductive parts of flower?
- b) What are the different part of pistil?
- c) What is pollination? Name its types.

OR

Where does fertilization occur in flower?

- Q39 A spherical mirror is a part of hollow glass sphere. One surface of mirror is silvered and then coated with red oxide and reflection takes place from the other surface. Spherical mirrors are used to form images of various types. Nature of image of an object placed in front of a mirror depends on the nature of mirror and position of the object.

Now answer the following questions:

- (i) What is the difference between virtual image formed by a concave mirror and by a convex mirror?
- (ii) Which mirror is used in the headlights of a vehicle?
- (iii) State any two rules of new cartesian sign convention followed for mirrors.

OR

Three mirrors, one plane, one concave, and one convex are lying on a table. How can a person identify them without touching them or using any other apparatus?

[086]