



ST KABIR PUBLIC SCHOOL, SEC. 26, CHANDIGARH
PRE BOARD EXAMINATION (2024-25)

JAIVIR

Class- X
Subject- SCIENCE (086)

Duration-3 hours
Max. Marks – 80

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 one most appropriate option out of the four options given for each of the questions 1 – 20

- 1 You must have seen a cooler stand made of iron is usually shiny when new, but after some time it loses its shine due to the formation of reddish-brown powder on its surface. This happens due to rusting of iron metal. The chemical reactions involved in the rusting of iron metal are: 1
 - A. Oxidation and displacement.
 - B. Oxidation and decomposition.
 - C. Reduction and Combination.
 - D. Oxidation and combination.
- 2 Some statements are given below: 1

Select the correct arrangement of the given metals P, Q, R, S in decreasing order

 - (i) Metal P salt solution is displaced by metal Q.
 - (ii) Metal Q salt solution is displaced by metal R.
 - (iii) Metal S salt solution is displaced by metal Q.
 - (iv) Metal S salt solution is not displaced by metal P.
 - A. $S > P > Q > R$
 - B. $R > Q > S > P$
 - C. $Q > P > S > R$
 - D. $R > Q > P > S$
- 3 Certain chemical properties of a substance are given below: 1
 - (i) It turns methyl orange red.
 - (ii) It turns turmeric paper red.
 - (iii) It reacts with zinc and a gas is evolved.
 - (iv) It reacts with solid sodium carbonate to give brisk effervescence.

in the following
respectively

CO₂

Which of the above properties are shown by dilute sodium hydroxide?

- A. (i) and (ii)
- B. (ii) and (iii)
- C. (i), (iii) and (iv)
- D. (iii) and (iv)

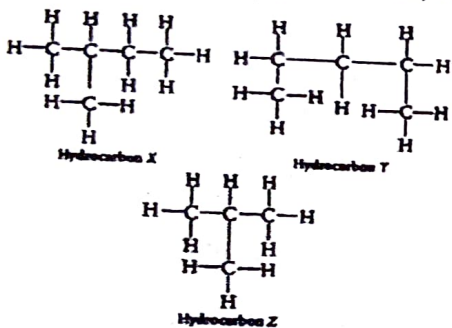
4 Strips of metal X were dipped into the solution of silver nitrate and zinc nitrate separately. A greyish metallic deposit was found on both strips. Metal X could be

- A. Cu
- B. Mg
- C. Pb
- D. Fe

5 Which of the Following are **not** Ionic Compounds (i) KCl (ii) HCl (iii) CCl₄ (iv) NaCl

- A. (i) and (iv)
- B. (ii) and (iii)
- C. (iii) and (iv)
- D. (i) and (iii)

6 The structures of three hydrocarbons, X, Y and Z are shown below:



By considering the following statements, identify the correct option.

- 1. X and Y are isomers.
- 2. X and Y have the same percentage composition by mass.
- 3. Y is the isomer of alkane having formula, C₅H₁₂
- 4. Z has the same boiling point as n-pentane.

- A. 1, 2 and 3
- B. 2 and 4
- C. 1 and 4
- D. 1, 3 and 4

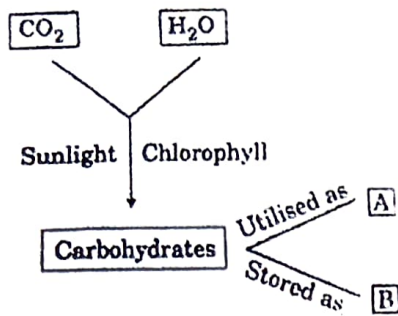
Which of the following statements are correct regarding isomers ?

- I. Isomers have same structural formula.
- II. Isomers have same molecular formula.
- III. Isomers have same chemical properties.
- IV. The compound C₂H₄ has no isomers.

- A. I and III only
- B. II and IV only
- C. I, III and IV only
- D. I, II, III and IV

1

In the following flow chart showing autotrophic nutrition in green plants, A and B respectively are:

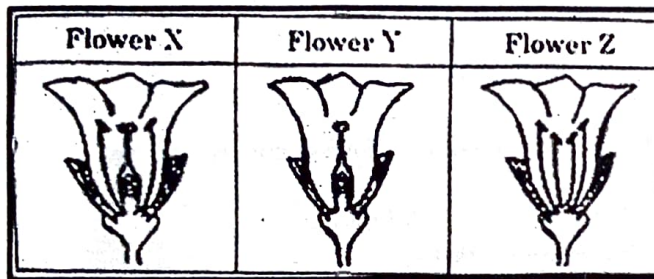


- A. Oxygen and energy B. Starch and oxygen
 C. Energy and starch D. Oxygen and water

9 Excessive exposure of humans to UV-rays results in
 i) Damage to immune system ii) Damage to lungs
 iii) Skin cancer iv) Peptic ulcers A

- A. (i) and (ii) B. (ii) and (iv) C. (i) and (iii) D. (iii) and (iv)

10 Consider the following three flowers namely X, Y and Z. Which flower(s) would develop into a fruit?



- A. 'X' only B. 'Z' only
 C. 'X' and 'Y' D. 'Y' and 'Z'

11 In a family, the parents are expecting their first child. What is the probability of the child being male?

- A. 25% B. 50% C. 75% D. 100%

12 During a health education class, the teacher explains how certain hormones contribute to physical changes during puberty. The class discusses how these changes are important for reproductive health and overall development in females. Which hormone is primarily responsible for the development of female secondary sexual characteristics, such as breast development and the regulation of the menstrual cycle?

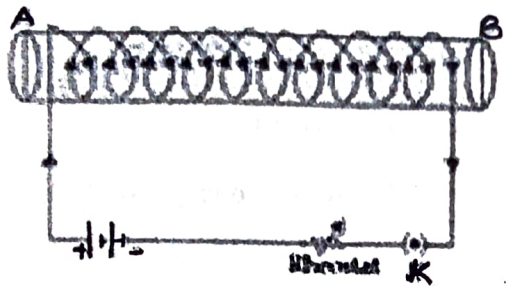
- A. Testosterone B. Oestrogen C. Progesterone D. Luteinizing hormone

- 3 In an effort to reduce energy consumption, a school decides to install solar panels. What is the likely direct effect of this decision? 1
- A. Increased fossil fuel dependency B. Reduced electricity bills
 C. Higher greenhouse gas emissions D. Decreased use of renewable resources

- 4 In which part of the cell does aerobic respiration primarily occur? 1
- A. Cytoplasm B. Nucleus C. Mitochondria D. Ribosome

- 5 When light enters the atmosphere, it strikes on extremely fine particles, which deflect the rays of light in all possible directions, This is due to – 1
- A. reflection of light B. atmospheric refraction
 C. scattering of light D. dispersion of light

- 6 When the plug of the key is closed, the face B of the iron bar will be 1



- A. N-pole B. S-pole
 C. N-pole if current is large D. S-pole if current is small

Q. no 17 to 20 are Assertion - Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R).

Answer these questions by selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of 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

- 7 **Assertion (A):** The product of resistivity and conductivity of a conductor depends on the material of the conductor. 1
Reason (R): Because each of resistivity and conductivity depends on the material of the conductor.

- 8 **Assertion (A):** Exposure of silver chloride to sunlight for a long time turns grey due to the formation of silver. 1
Reason (R): In this process, sublimation of silver chloride takes place.

- 9 **Assertion (A):** Plastic pollution is a major environmental issue today. 1
Reason (R): Plastics take hundreds of years to decompose and can harm wildlife.

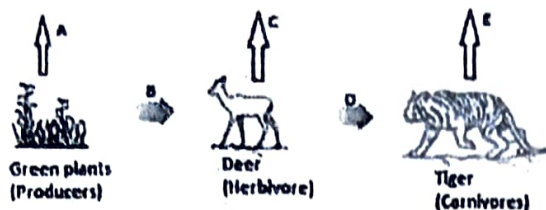
- 10 **Assertion (A):** Gustatory receptors detect taste. 1
Reason (R): Olfactory receptor are present in cerebellum.

SECTION – B

Q. no. 21 to 26 are very short answer questions.

Imagine you accidentally step on a sharp object, like a nail, while walking barefoot. Explain the biological process behind your immediate withdrawal of the foot, detailing the roles of the sensory neurons, spinal cord, and motor neurons.

- 22 In the following food chain, vertical arrows indicate the energy lost to the environment and horizontal arrows indicate energy transferred to the next trophic level. Which one of the three vertical arrows (A, C and E) and which one of the two horizontal arrows (B and D) will represent more energy transfer? Give reason for your answer.



Food chain in a Forest Ecosystem

- 23 Explain the difference between positive and negative tropisms. Provide one example of each type of tropic movement in plants.

OR

Discuss how auxins play a crucial role in tropic movements. Explain the mechanism by which auxins facilitate phototropism in plants.

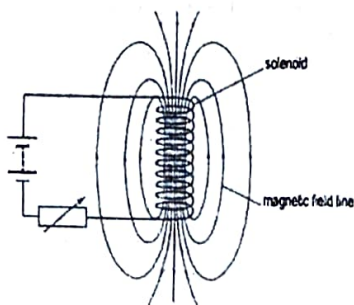
- 24 The pH of soil A is 7.5 while that of soil B is 4.5. Which of the two soils, A or B, should be treated with powdered chalk to adjust its pH and why?
- 25 An electric oven of 2 kW power rating is operated in a domestic electric circuit (220V) that has a current rating of 5.A. What result do you expect? Explain.

OR

A torch bulb has a resistance of 1Ω when cold. It draws a current of 0.2 A from a source of 2 V and glows. Calculate

- the resistance of the bulb when glowing and
- explain the reason for the difference in resistance.

- 26 Refer to the image below and state how the magnetic field pattern indicates regions where the magnetic field is stronger outside the magnet? What happens to the magnetic field when the current in the circuit is reversed?



metal M is f...
M. How can me...
equations.

SECTION - C

Q.no. 27 to 33 are short answer questions.

27

Aditya and his friend Manoj placed a candle flame in front of a convex lens at various distances from it

3

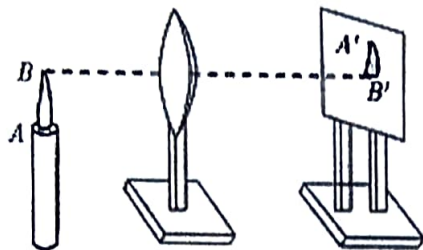
and obtained the image of the candle flame on a white screen.

He noted down the position of the candle, screen and the lens as below

Position of candle = 20 cm

Position of convex lens = 50 cm

Position of the screen = 80 cm



- What is the position of the image formed from the convex Lens?
- What is the focal length of the convex lens?
- Where will the image be formed, if he shifts the candle towards the lens at a position of 35 cm?

28

How will the magnetic field produced by a current carrying circular coil change if we:

3

- increase the current flowing through the coil?
- reverse direction of current through the coil?
- increase the number of turns in the coil?

29

A ray of monochromatic light is incident on one of the faces of an equilateral triangular prism of refraction angle A . Trace the path of ray passing through the prism. Mark angle of incidence, angle of emergence and angle of deviation. Also state the condition for minimum deviation through the prism.

3

30

Explain the following

3

(a) Reactivity of Al decreases if it is dipped in HNO_3

(b) Carbon cannot reduce the oxides of Na or Mg

(c) NaCl is not a conductor of electricity in the solid-state whereas it does conduct electricity in aqueous solution as well as in molten state

A metal M is found in nature as MCO_3 . It is used in galvanizing Fe articles. Name the Metal M. How can metal M be obtained from its Carbonate Ore? Explain with the help of chemical equations. 3

OR

A student was given Mn, Zn, Fe, and Cu metals. Identify which of them

- a) will not displace H_2 from dil HCl.
- b) will react only with steam to give H_2 gas.
- c) will give H_2 with 5% HNO_3

Write the chemical equations involved.

32 Two major forces help in the transport of water in a plant. Force A is the driving force in the movement of water during the day, whereas force B helps the movement of water in a plant during the night or during the day when humidity is very high. 3

- a) Identify force A and B.
- b) Describe how each of these forces helps in the movement of water in plants.

33 A patient is diagnosed with a kidney disorder that affects the functioning of nephrons, which are vital for urine production. 3

- a) Draw a well-labelled diagram of a nephron and highlight the main parts involved in the process of urine formation.
- b) Explain how each part of the nephron contributes to the stages of urine production: filtration, reabsorption, and secretion.

SECTION – D

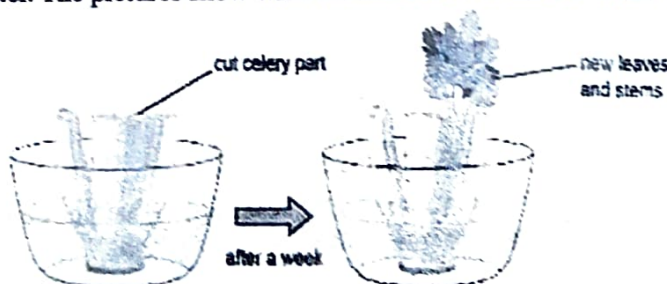
Q.no. 34 to 36 are Long answer questions.

34 a) Identify and explain two key reasons why variations appear among the progeny formed by sexual reproduction. Analyze how variations can contribute to the survival and adaptation in changing environmental conditions. 5

- b) You are a health educator in a community that is experiencing high rates of unplanned pregnancies. Based on your understanding of contraceptive methods, make people aware by explaining any three contraceptive methods and how do they work?

OR

A) Medha cut a celery plant into two pieces. She placed the lower part of the cut celery in a jar of water. The pictures show what Medha observed after a week.



- a) What can Medha conclude from her activity?
- b) Give two examples of any other organisms which can also reproduce by the same process.
- c) Evaluate the effectiveness of using plant tissue culture in laboratories for growing new plants.

B) In flowering plants, double fertilization is a unique process involving the fusion of one male gamete with the egg cell and another male gamete with two polar nuclei. Explain how this process contributes to seed and fruit development, and why it is essential for the plant's reproductive success.

5 An organic compound P with molecular formula C_2H_6O is an active ingredient of all alcoholic drinks and used in medicines like tincture of iodine. 5

(a) Identify P and draw its structure.

(b) A small piece of Na is added into the test tube with P. A new compound Q is formed. Identify Q and write the chemical equation

(c) What is denatured alcohol?

(d) What is the role of concentrated Sulphuric acid when it is heated with Ethanol at 443 K. Give the reaction involved

OR

Shristi heated Ethanol with a compound A in presence of a few drops of concentrated sulphuric acid and observed a sweet smelling compound B is formed. When B is treated with sodium hydroxide it gives back Ethanol and a compound C.

(a) Identify A and C

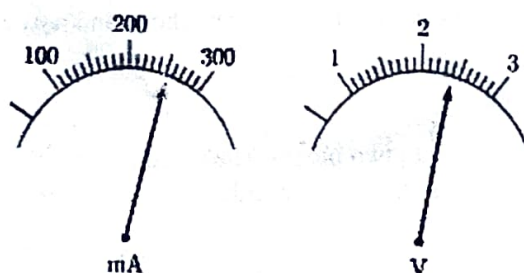
(b) Give one use each of compounds A and B.

(c) Write the chemical reactions involved and name the reactions.

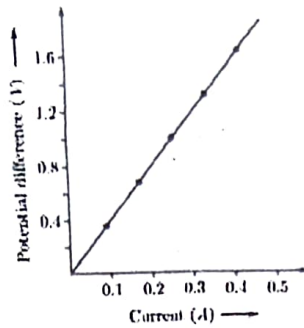
A. The current flowing through a resistor connected in a circuit and the potential difference developed across its ends are as shown in the diagram by milli-ammeter and voltmeter readings respectively: 5

(i) What are the least counts of these meters?

(ii) What is the resistance of the resistor?



B. V-I graph for a nichrome wire is given on the next page. What do you infer from this graph? Draw a labelled circuit diagram to obtain such a graph.



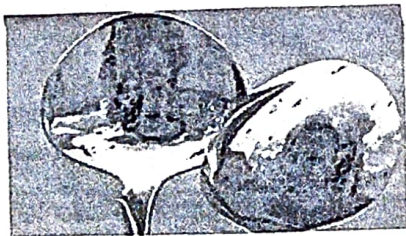
OR

- A. Define power and state its SI unit.
 B. A torch bulb is rated 5 V and 500 mA. Calculate its
 (i) power
 (ii) resistance
 (iii) energy consumed when it is lighted for two and a half hours.

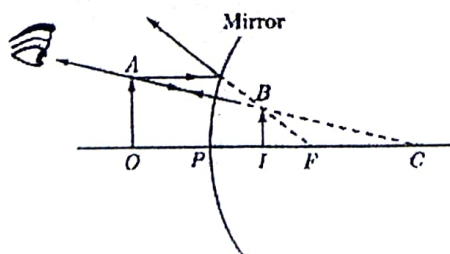
SECTION - E

**Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts.
 Internal choice is provided in one of these sub-parts.**

- 37 After coming from playground, Tanu feels very hungry. But still some more time was required by her mother to cook food. While waiting on dining table Tanu was playing with her spoon. All of sudden she observed two different orientations of her face when she looked her face from both sides of spoon. She was confused why the orientation of her face changed in two cases. She was curious to know why her reflected image appears upside down in the one surface of a spoon but the correct way up in the opposite surface.



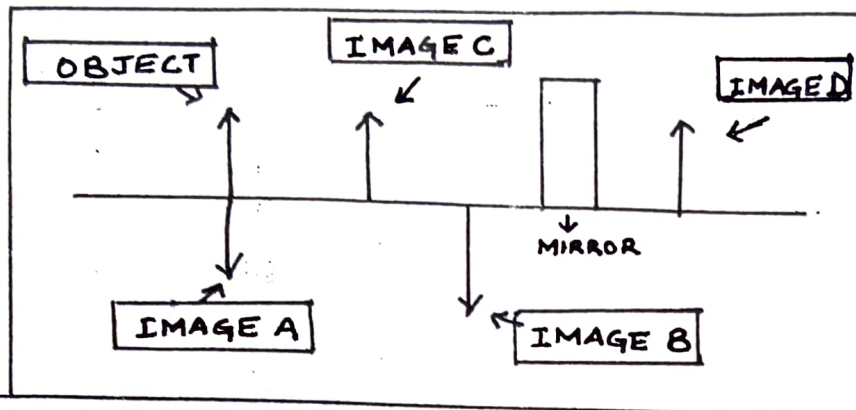
- A. Which type of image is formed on the both surface of spoon?
 B. The given ray diagram depict the correct explanation of the image formed by one surface of the spoon. Name the surface which can form the image as depicted in given ray diagram?



- C. As Tanu moves the concave surface of spoon towards her face, again she finds that there comes a point (provided the spoon is big enough) where her image flips from inverted to upright. State the condition under which it happens? Is this image real or virtual?

OR

- C. Tanu was trying to form image using a concave mirror. She got an inverted and real image of same size of the object. Given figure shows four possible positions of the image formed. Figure out the /correct position and justify it.



8

Read the information given and answer the following questions:

A horticulturist is studying fruit color in a type of plant where the allele for yellow fruit is dominant over green fruit. The horticulturist crosses a homozygous yellow-fruited plant with a homozygous green-fruited plant.

4

- What will be the genotypes of the parent generation?
- What will be the genotypes and phenotypes of the F1 generation?
- If two F1 plants are crossed, what will be the ratio of heterozygous dominant and homozygous recessive in the F2 generation? Show with the help of cross.

OR

- If two F1 plants are crossed, what will be the ratio of homozygous dominant and homozygous recessive in the F2 generation? Show with the help of cross.

9

A group of students conducted an experiment to investigate the combustion of different carbon compounds. They recorded some observations:

4

Compound	Observation	Products Identified
X	Burns with a clean flame	
Y		Carbon monoxide and soot
Z	Burns with a yellow flame	
W	Burns with a smoky flame and produces water	Carbon dioxide, water, and soot

- Which compound is likely to be a saturated hydrocarbon based on the observations? What products will be formed in this case?
- Why some of the above compounds burn with a yellow/sooty flame?

OR

- Which of the above compounds will show addition reaction? Give one such example of an addition reaction.

Aradhya
28/12/24
Suresh
28/12/24

Chirpa
27/12/24

Seema
28/12/24