CBSE EXAMINATION PAPER-2025

SCIENCE

(Solved)

Time allowed : 3 hours | Maximum Marks : 90

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **45 questions.** All questions are **compulsory.**

ii. This question paper is divided into **5 sections.**

iii. **Section A** – questions number **1 to 3** are case based questions

iv. **Section B** – questions number **4 to 23** are multiple choice questions

v. **Section C** – questions number **24 to 31** are very short answer

vi. **Section D** – questions number **32 to 39** are short answer

vii. **Section E** – questions number **40 to 45** are long answer

viii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

ix. Use of calculator is NOT allowed.

Section A

Question 1.

'A' and 'B' are two salts used for washing purposes. Salt 'A' is used for bathing also. Four test tubes I, II, III and IV as mentioned below are taken.

I. Rain water + solution of salt 'A'

II. Rain water + solution of salt 'B'

III. Tubewell water + solution of salt 'A'

IV. Tubewell water + solution of salt ‘B’

The test tubes are shaken one by one almost identically for the same time and the lengths of foam formed in each test tube is noted.

(1) Differentiate between salt A and salt B.

[1 Marks]

(2) In which one of the four test tubes is the foam formed the minimum?

[1 Marks]

(3) What are esters? What happens when an ester reacts with an alkali (say sodium hydroxide)? Give a chemical equation for the reaction.

[2 Marks]

(4)

What is the cause of hardness of water ? Sometimes it is observed that while bathing foam is formed with difficulty and an insoluble substance is formed. Name this substance and write the cause of its formation.

[2 Marks]

Question 2.

A person while climbing up a rocky hill comes into a panic state and fear. His body starts reacting in a ‘flight-or-flight’ condition to adjust to the dangerous and stressful situation.

Based on the above facts, answer the questions that follow.

(1) Name the hormone secreted in the blood of the person in this situation.

[2 Marks]

(2) State any two responses in the body of the person as a result of the secretion of this hormone.

[1 Marks]

(3) How does the action of the chemical signal in terms of hormones differ from the electrical impulses via nerve cells?

[1 Marks]

(4)

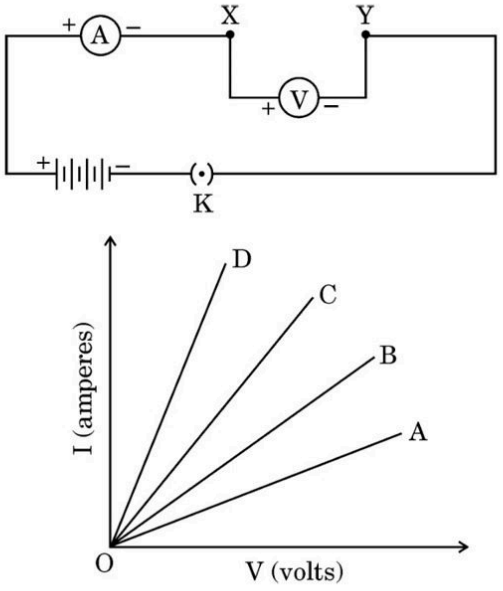
Name the source gland of the hormone secreted in this condition.

[2 Marks]

Question 3.

As shown in the diagram, an electric circuit consisting of an ammeter, a voltmeter, 4 cells of 1·5 V each, a plug key with a gap XY was set up. Voltmeter and ammeter readings were recorded in the observation table for four arrangements as given below :
Arrangement No. 1 – only resistor R_1 in gap XY
Arrangement No. 2 – only resistor R_2 in gap XY
Arrangement No. 3 – Resistors R_1 and R_2 in series in gap XY
Arrangement No. 4 – Resistors R_1 and R_2 in parallel in gap XY

Based on the observations, four V – I graphs A, B, C and D as shown in figure were drawn. Study these graphs.



(1) Which one of the graphs represents the series combination of R_1 and R_2 ?

[1 Marks]

(2) A battery of 6 V is connected with a series combination of five resistors of 0·1Ω , 0·2 Ω, 0·3Ω , 0·4 Ω and 0·5Ω. How much current would flow through the 0·3Ω resistor ? Justify your answer.

[2 Marks]

(3) Which one of these graphs represents the parallel combination of R_1 and R_2?

[1 Marks]

(4) Show an arrangement of three resistors, each of resistance 10Ω , so that the combination has a resistance of 15Ω . Give justification for your answer.

[2 Marks]

Section B

Question 4.

Consider the following chemical equation:

p Al + q H_2O ⟶ r Al_2O_3 + s H_2

To balance this chemical equation, the values of ‘p’, ‘q’, ‘r’ and ‘s’ must be respectively:

[1 Marks]

(A) 3, 1, 2, 2

(B) 2, 3, 3, 1

(C) 3, 2, 2, 1

(D) 2, 3, 1, 3

Question 5.

Which of the given option represents a family of salts?

[1 Marks]

(A) $MgSO_4$, $CuSO_4$, $MgCl_2$

(B) $NaNO_3$, $CaCO_3$, Na_2CO_3

(C) K_2SO_4, Na_2SO_4, $CaSO_4$

(D) NaCl, Na_2SO_4, $CaSO_4$

Question 6.

The most common method of extraction of metals from their oxide ores is :

[1 Marks]

(A) Reduction with carbon

(B) Reduction with aluminium

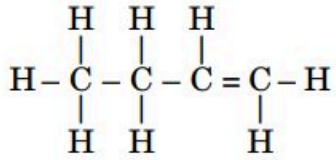
(C) Electrolytic reduction

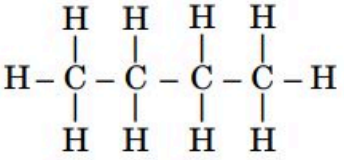
(D) Reduction with hydrogen

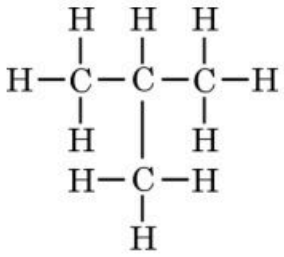
Question 7.

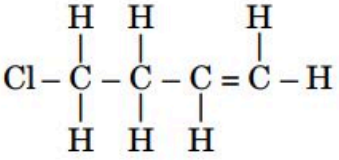
Given below are the structures of some hydrocarbons. Select the two structures which are related to each other from the given options :

[1 Marks]

(i) 

(ii) 

(iii) 

(iv) 

(A) (ii) and (iii)

(B) (ii) and (iv)

(C) (i) and (iv)

(D) (i) and (iii)

Question 8.

Choose the incorrect statement about the common reaction used in hydrogenation of vegetable oils.

[1 Marks]

(A) It is an addition reaction.

(B) It takes place in the presence of nickel or palladium catalyst.

(C) The product contains only single bonds between carbon atoms.

(D) It is an addition reaction which occurs in the presence of an acid catalyst.

Question 9.

Match Column-I with Column-II and select the correct option from the choices provided.

[1 Marks]

	Column-I		*Column-II*
a.	Site of fertilisation of egg with the sperm	(i)	Vagina
b.	Site of implantation of embryo	(ii)	Uterus
c.	Site of entry of sperm into the female reproductive tract	(iii)	Oviduct
d.	Site through which the waste materials generated by the developing embryo are removed	(iv)	Placenta
		(v)	Cervix

(A) a-(iii), b-(ii), c-(i), d-(iv)

(B) a-(iii), b-(i), c-(v), d-(iv)

(C) a-(ii), b-(i), c-(v), d-(iv)

(D) a-(iv), b-(ii), c-(iii), d-(i)

Question 10.

The part of the brain which maintains the posture and balance of the body is :

[1 Marks]

(A) Cerebellum

(B) Cerebrum

(C) Pons

(D) Medulla

Question 11.

The plant hormone present in greater concentration in the areas of rapidly dividing cells is :

[1 Marks]

(A) Gibberellins

(B) Abscisic acid

(C) Cytokinins

(D) Auxin

Question 12.

Select a pair of bisexual flowers from the following :

[1 Marks]

(A) Papaya and mustard

(B) Hibiscus and mustard

(C) Hibiscus and watermelon

(D) Hibiscus and papaya

Question 13.

The gastric glands present in the wall of the stomach release :

[1 Marks]

(A) Mucus and Trypsin

(B) Pepsin and Salivary amylase

(C) Pepsin and Trypsin

(D) Mucus and Pepsin

Question 14.

Absolute refractive index of water and glass is $4/3$ and $3/2$ respectively. If the speed of light in glass is 2×10^8 m/s, the speed of light in water is:

[1 Marks]

(A) $9/4$ m/s

(B) $16/9$ m/s

(C) $7/3$ m/s

(D) $9/8$ m/s

Question 15.

When a beam of white light passes through a region of very fine dust particles, the colour of light that scatters the most in that region is :

[1 Marks]

(A) red

(B) orange

(C) blue

(D) yellow

Question 16.

A wire of length 'l' is gradually stretched so that its length increases to 3l. If its original resistance is R, then its new resistance will be :

[1 Marks]

(A) 9R

(B) 27R

(C) 6R

(D) 3R

Question 17.

Which one of the following statements is not true about a bar magnet ?

[1 Marks]

(A) It produces magnetic field lines.

(B) It has attractive power for iron filings.

(C) The direction of magnetic field lines inside a bar magnet is from its north pole to its south pole.

(D) It sets itself in north-south direction when suspended freely.

Question 18.

The strength of magnetic field produced inside a long straight current carrying solenoid does not depend upon :

[1 Marks]

(A) number of turns in the solenoid

(B) radius of the coil of the solenoid

(C) material of the core filled inside the solenoid

(D) direction of current flowing through the solenoid

Question 19.

Other than the abiotic components, which of the given biotic components are not required to make an aquarium with small herbivorous fishes a self-sustaining system ?

(i) Aquatic plants and aquatic animals

(ii) Terrestrial plants and terrestrial animals

(iii) Decomposers as bacteria and fungi

(iv) Consumers as clown fishes and sea urchins

[1 Marks]

(A) (ii) and (iv)

(B) (ii) and (iii)

(C) (i) and (iv)

(D) (i) and (iii)

Question 20.

Assertion (A) : Hydrogen gas is not evolved when a metal reacts with nitric acid.

Reason (R) : Nitric acid is a strong reducing agent and reduces the hydrogen produced in the reaction to water.

[1 Marks]

(A) Assertion (A) is false, but Reason (R) is true.

(B) Assertion (A) is true, but Reason (R) is false.

(C) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

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

Question 21.

Assertion (A) : In our actions of writing or talking, our nervous system communicates with the muscles.

Reason (R) : Cranial nerves and spinal nerves form the peripheral nervous system.

[1 Marks]

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

(B) Assertion (A) is false, but Reason (R) is true.

(C) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(D) Assertion (A) is true, but Reason (R) is false.

Question 22.

Assertion (A) : Magnetic field lines around a bar magnet never intersect each other.

Reason (R) : Magnetic field produced by a bar magnet is a quantity that has both magnitude and direction.

[1 Marks]

(A) Assertion (A) is true, but Reason (R) is false.

(B) Assertion (A) is false, but Reason (R) is true.

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

(D) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Question 23.

Assertion (A) : Use of jute bags for shopping reduces pollution.

Reason (R) : Jute is biodegradable and its bag may be reused as and when needed.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Assertion (A) is true, but Reason (R) is false.

(C) Assertion (A) is false, but Reason (R) is true.

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

Section C

Question 24. List the possible sources of energy required in decomposition reactions. Illustrate any one with a suitable example.

[2 Marks]

Question 25. What is observed when hydrated ferrous sulphate crystals are heated in a dry boiling tube? Give balanced chemical equation(s) of the reaction(s) that occur(s).

[2 Marks]

Question 26.

(a) Write the formula of the ions which (i) acids, and (ii) bases generate in water solutions.

(b) Dry HCl gas does not change the colour of dry litmus paper. Why ?

[2 Marks]

Question 27. State the main function of veins in human circulatory system. Why do they not need thick walls?

[2 Marks]

Question 28.

(a) Explain how the proteins control the 'characteristics' in an organism with the help of an example of 'tallness' trait in pea plant.

(b) Name the section of DNA that controls the 'characteristics' in an organism.

[2 Marks]

Question 29. A student has difficulty in reading his textbooks but can read the blackboard clearly while sitting in the last row. Name the defect of vision the student is suffering from. List two reasons due to which this defect arises. Write the nature of the lenses required to correct this defect.

[2 Marks]

Question 30. Draw a ray diagram to show the path of a ray of light falling obliquely on one of the refracting faces of a triangular glass prism and mark the angle of deviation on it.

[2 Marks]

Question 31. An electric kettle is rated 230 V; 1000 W. Calculate the resistance of its heating element when in operation.

[2 Marks]

Section D

Question 32.

(a) What is a reactivity series of elements ? How is it developed ? Arrange the following elements as they are arranged in the reactivity series : Aluminum, Calcium, Copper, Lead

(b) Write balanced chemical equation to show the reaction of iron (III) oxide (Fe_2O_3)with aluminium.

[3 Marks]

Question 33. Common salt is an important raw material for various chemicals of daily use. State in brief the method of preparation of (i) Sodium hydroxide, and (ii) Sodium hydrogen carbonate from common salt. Write balanced chemical equations of the reactions that occur.

[3 Marks]

Question 34.

On the basis of the characteristics of the processes given in the brackets in each case, differentiate between the following:

(a) Products of breakdown of pyruvate in aerobic and anaerobic respiration in human beings (product(s) of the processes)

(b) Respiration and photosynthesis in plants (gas released)

(c) Respiration in terrestrial animals and fishes (organs involved)

[3 Marks]

Question 35.

A pure pea plant having round (R), yellow (Y) seeds is crossed with another pure pea plant having wrinkled (r), green (y) seeds. Subsequently F_1 progeny is self-pollinated to obtain F_2 progeny.

(a) What do the seeds of F_1 generation look like?

(b) Give the possible combinations of traits in seeds of F_2 generation. Also give their ratio.

(c) State the reason of obtaining seeds of new combination of traits in F_2 generation.

[3 Marks]

Question 36. What is a rainbow? Draw a labelled diagram to show its formation.

[3 Marks]

Question 37.

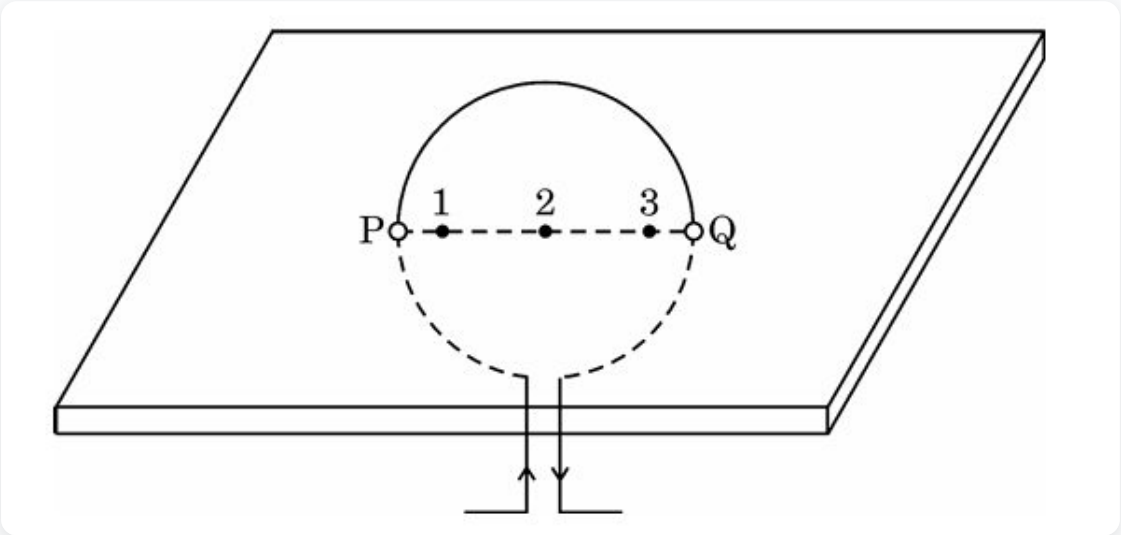
Consider a rectangular cardboard having two holes P and Q through which a current carrying circular loop has been inserted as shown in the diagram.

(a) Make this diagram on your answer sheet and draw three magnetic field lines, one each passing through the points 1 (near P), 2 (at the centre of the loop) and 3 (near Q).

(b) List two factors on which the intensity of the magnetic field produced at the centre of the loop depends.

(c) Name the rule you will apply to determine the direction of magnetic field produced due to a current carrying straight conductor.

[3 Marks]



Question 38.

(a) ‘‘In a food chain energy flow is unidirectional.’’ Give two reasons for the given statement.

(b) If 10,000 J energy is available at the producer level, how much energy will be available to the secondary consumers ? Give reason to justify your answer.

[3 Marks]

Question 39.

Design an experimental set-up to demonstrate that ‘‘Alcohol and glucose contain hydrogen but are not categorised as acids’’. Also give the reason to justify this fact.

[3 Marks]

Section E

Question 40.

(i) Consider the following metals : K, Ca, Al, Cu, Ag, Fe Select from the above metals, a metal which

I. does not react with oxygen even at high temperature.

II. reacts with oxygen at ordinary temperature and forms a protective oxide layer which prevents the metal from further oxidation.

III. catches fire when kept in the open.

IV. does not burn in oxygen but the hot metal is coated with a black coloured oxide layer.

(ii) What are amphoteric oxides ? With the help of balanced chemical equations show that aluminium oxide is an amphoteric oxide.

(iii) What are alkalis ? Give one example.

[5 Marks]

Question 41.

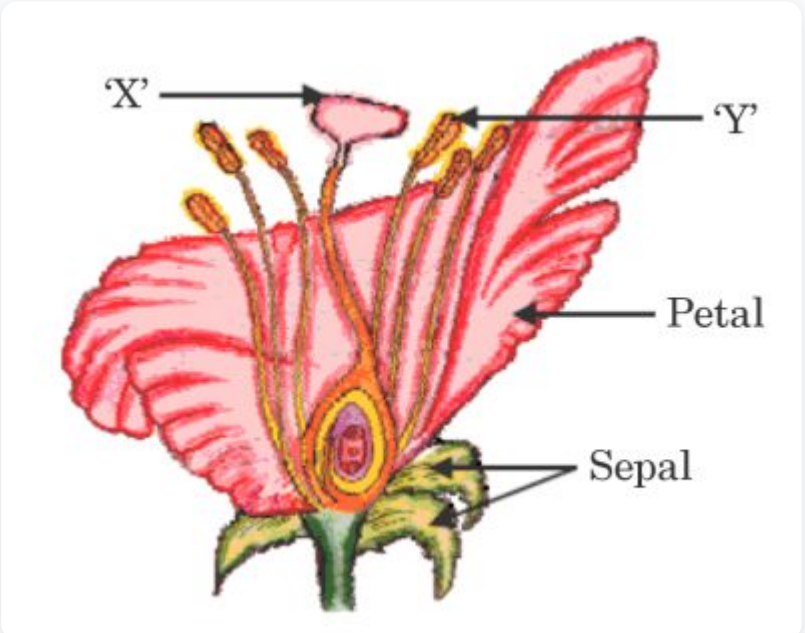
(i) Identify the parts 'X' and 'Y' in the figure given below :

(ii) Name the yellowish coloured structures produced by the part labelled as 'Y'.

(iii) Write the name of the process by which these are transferred to the part labelled as 'X'.

(iv) Explain the process of seed formation in a flowering plant.

[5 Marks]



Question 42.

(i) ‘‘In refraction of light through a rectangular glass slab, the emergent ray is always parallel to the direction of the incident ray.’’ Why ? Explain with the help of a ray diagram. What happens when a ray of light falls normally on one of the faces of a rectangular glass prism ? Draw diagram.

(ii) An object is placed at a distance of 30 cm from the optical centre of a concave lens of focal length 20 cm. Use Lens formula to determine the position of the image formed in this case.

[5 Marks]

Question 43.

(i) With the help of balanced chemical equations state the process of extracting

(I) mercury from its ore called cinnabar, and

(II) copper from its sulphide ore.

(ii) Silver and copper articles slowly lose their shiny surfaces when exposed to air. Name the compounds formed on

(I) silver articles, and

(II) copper articles in the form of coating.

[5 Marks]

Question 44.

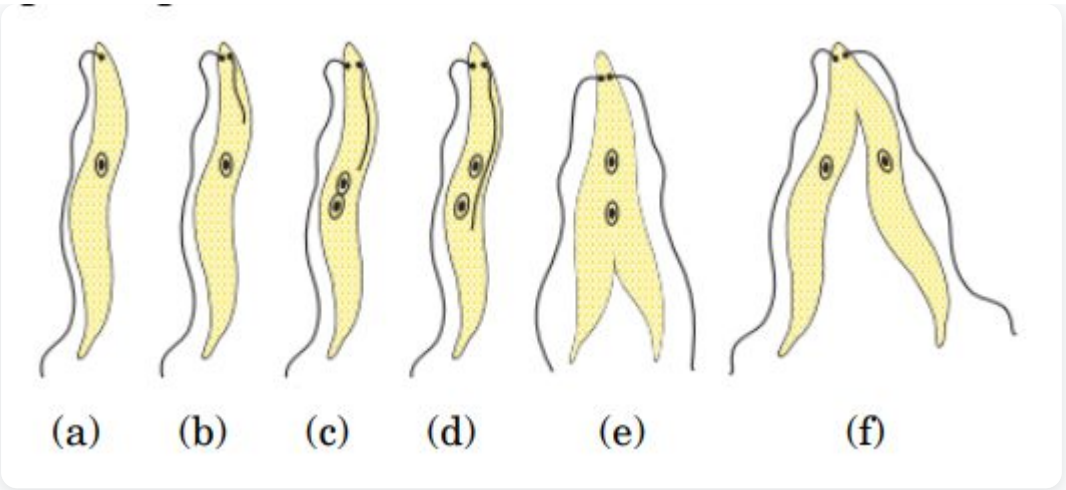
(i) Name the type of asexual mode of reproduction shown in the given figure.

(ii) Identify the unicellular organism in the diagram.

(iii) List any two advantages of asexual reproduction over sexual reproduction.

(iv) Name and explain any one mode of asexual reproduction observed in Hydra.

[5 Marks]



Question 45.

(i) A student wishes to study the image formation by a concave mirror using candle flame as object. State the type of the image formed by the mirror and mention the change in the image formed, if any, that he observes when the candle flame is gradually moved away from the pole of the mirror. Draw a ray diagram to show the image formation when the object distance is nearly equal to the radius of curvature of the mirror.

(ii) A convex mirror used for rear-view on an automobile has a focal length of 3·0 m. If a bus is located at 6·0 m from this mirror, use mirror formula to find the position of the image of the bus as seen in the mirror.

[5 Marks]