SCIENCE – CODE NO. 086
SAMPLE QUESTION PAPER – 2
CLASS – X (2026-27)

Max. Marks: 80 **Time Allowed: 3 hours**

General Instructions:

(i) This question paper consists of **39** questions in **3** sections. **Section A is Biology** (Q.1–16, 30 marks), **Section B is Chemistry** (Q.17–29, 25 marks) and **Section C is Physics** (Q.30–39, 25 marks).

(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of the alternatives in such questions.

(iii) Multiple choice and Assertion-Reason questions carry 1 mark each. Other questions carry 2, 3, 4 (case/source-based) or 5 marks, as indicated against each question.

(iv) Answers should be brief and to the point. Draw neat, labelled diagrams wherever required.

(v) Use of calculators is not permitted.

SECTION – A (BIOLOGY)
Questions 1 to 16

1. Which of the following organisms obtains its nutrition from a living plant without killing it? **1**

A. Amoeba
B. Cuscuta (amar-bel)
C. Mushroom
D. Paramoecium

2. The enzyme that digests proteins in the acidic medium of the stomach is **1**

A. trypsin
B. pepsin
C. lipase
D. salivary amylase

3. Blood flows only in one direction in the veins because **1**

A. veins have thick, elastic walls
B. veins contain valves
C. blood in veins is under very high pressure
D. veins are one-cell thick

4. A person shows a swollen neck. The hormone, the gland and the dietary deficiency most likely involved are **1**

A. insulin – pancreas – sugar
B. thyroxin – thyroid – iodine
C. growth hormone – pituitary – protein
D. adrenaline – adrenal – iron

5. A Planaria is cut into several pieces and each piece grows into a complete organism. This is called **1**

A. budding
B. fragmentation
C. regeneration
D. multiple fission

6. A man with blood group A marries a woman with blood group O, and their daughter has blood group O. From this information alone we can conclude that **1**

A. blood group A is dominant
B. blood group O is dominant
C. both are equally dominant
D. it is not enough to decide which trait is dominant

7. Which of the following is NOT a natural ecosystem? **1**

A. Pond
B. Forest
C. Aquarium
D. Lake

The following question(s) consist of two statements – Assertion (A) and Reason (R). Answer 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.

8. **Assertion (A):** The ventricles of the human heart have thicker muscular walls than the atria. **1**
Reason (R): The ventricles have to pump blood into various organs of the body.

9. **Assertion (A):** Abscisic acid is a plant hormone that promotes growth of the stem. **1**
Reason (R): Plant hormones are synthesised at places away from where they act and diffuse to the area of action.

10. A. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds? **2**
B. Which blood cells help to plug leaks at a point of injury, and why is this important?

11. Students to attempt either option A or B. **2**
A. State one function each of thyroxin and growth hormone. What disorder results from deficiency of growth hormone in childhood?
OR
B. What happens at a synapse between two neurons? Why does a nerve impulse travel only in one direction across it?

12. A. Why does the lining of the uterus become thick and spongy every month? **2**
B. What happens to this lining if the egg is not fertilised? Name the process and state its approximate duration.

13. Study the flow chart showing the break-down of glucose by different pathways. **3**

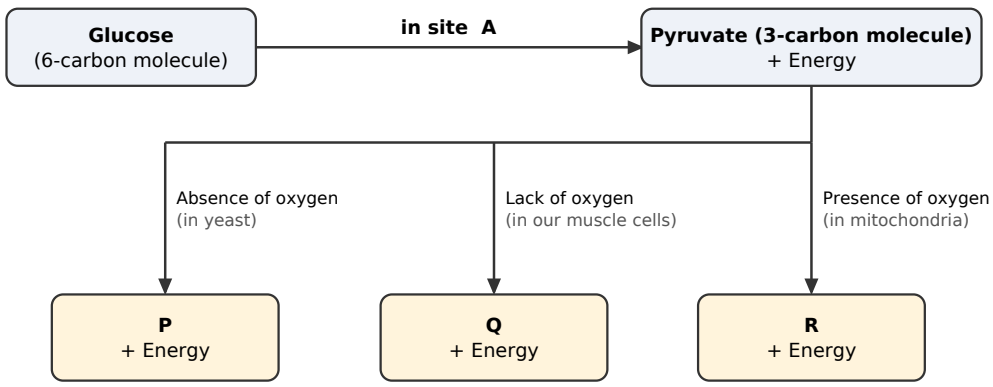
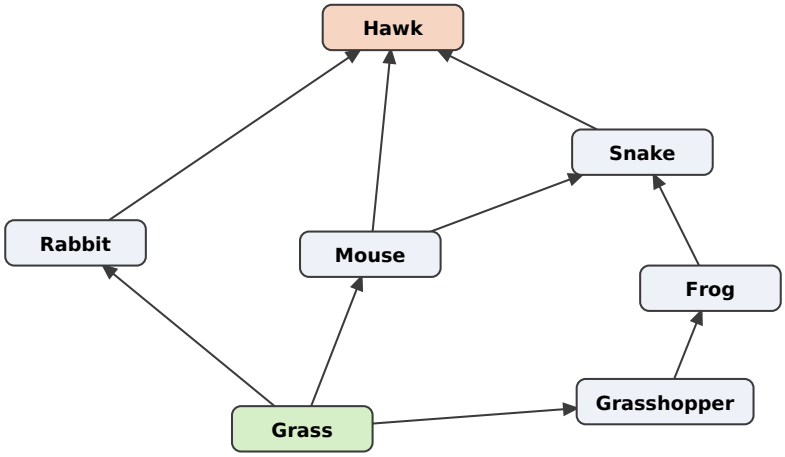


Figure: Break-down of glucose by various pathways

A. Name site A and the products R.
B. In which organism does pathway P occur and what is this process called?
C. Name the molecule in which the energy released is stored. Why is pathway R most useful for an active organism?

14. Study the food web of a grassland ecosystem shown below. **3**



Arrows point from the organism eaten to the organism that eats it

A. Write one food chain from this web that has exactly four trophic levels.

B. If a non-biodegradable pesticide is sprayed on the grass, which organism will show the highest concentration of it? Why?

C. What will happen to the grass if all the rabbits, mice and grasshoppers are removed?

15. **Case study:** Asha crossed a pure-breeding pea plant having round, yellow seeds (RRYY) with a pure-breeding plant having wrinkled, green seeds (rryy). The F_1 plants were self-pollinated, and 1600 seeds were obtained in the F_2 generation. **4**

A. What type of seeds will the F_1 plants produce? Write their genotype. **(1)**

B. How many of the 1600 F_2 seeds are expected to be wrinkled and green? **(1)**

Attempt either sub-part C or D.

C. Which new combinations of traits, not seen in either parent, appear in F_2? How many such seeds are expected in all, and what does this show? **(2)**

OR

D. Write the four kinds of gametes formed by the F_1 plants. Why must the genes for seed shape and seed colour be on separate chromosomes for these results? **(2)**

16. Students to attempt either option A or B. **5**

A. I. Trace the digestion of starch in a meal of rice, from the mouth to the small intestine, naming the enzymes or juices involved. **(3)**

II. How are the villi of the small intestine suited to their function? Why does the stomach wall not get damaged by its own acid? **(2)**

OR

B. I. Name the three major regions of the human brain. State the functions of the fore-brain, the cerebellum and the medulla. **(3)**

II. Give two differences between nervous and hormonal control in animals. **(2)**

SECTION – B (CHEMISTRY)

Questions 17 to 29

17. When green ferrous sulphate crystals are heated strongly in a dry boiling tube, the gases evolved are **1**

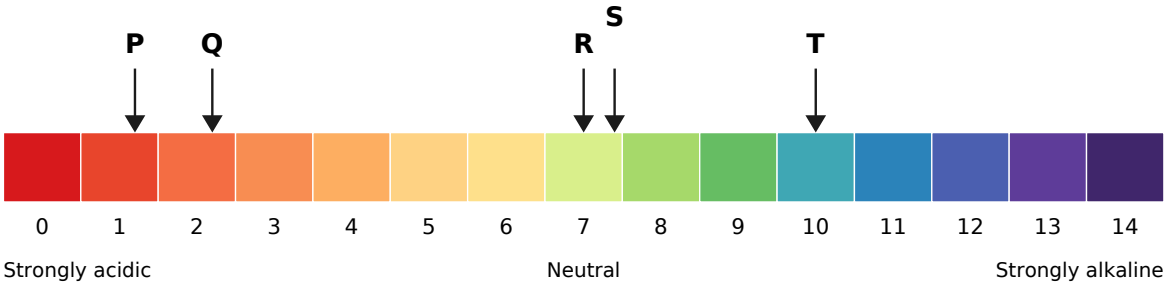
A. SO_2 and SO_3

B. SO_2 and O_2

C. SO_3 and H_2

D. H_2S and SO_2

18. Five solutions were tested with universal indicator and their pH values marked P, Q, R, S and T on the scale shown. Which of them could be milk of magnesia, and which has the highest hydrogen ion concentration? **1**



A. T; P
B. P; T
C. R; S
D. S; Q

19. An element X has electronic configuration 2, 8, 2 and an element Y has 2, 8, 7. The compound formed between them has the formula and type of bonding **1**

A. XY, covalent
B. XY_2, ionic
C. X_2Y, ionic
D. XY_2, covalent

20. Sodium, magnesium and calcium are obtained by **1**

A. heating their oxides with carbon
B. heating their sulphides in air
C. electrolytic reduction of their molten chlorides
D. displacement by copper from their salt solutions

21. The total number of single covalent bonds in a molecule of propane (C_3H_8) is **1**

A. 8
B. 10
C. 11
D. 12

22. Marble chips react with dilute hydrochloric acid with effervescence. The gas evolved and the test for it are **1**

A. hydrogen – burns with a pop sound
B. carbon dioxide – turns lime water milky
C. oxygen – relights a glowing splint
D. chlorine – bleaches moist litmus

23. Packets of chips are flushed with nitrogen gas to **1**

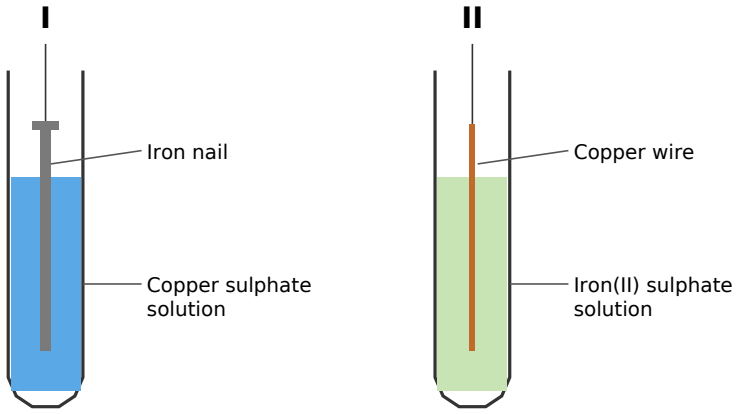
A. make the chips crispy by heating
B. prevent oxidation of fats and oils (rancidity)
C. kill germs present in the chips
D. add flavour to the chips

The following question(s) consist of two statements – Assertion (A) and Reason (R). Answer 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.

24. **Assertion (A):** Copper does not liberate hydrogen gas when added to dilute hydrochloric acid. **1**
Reason (R): Copper is placed below hydrogen in the reactivity series.

25. A student set up the two test tubes shown and left them for about 20 minutes. **2**



Both test tubes left undisturbed for about 20 minutes

A. In which test tube does a reaction take place? Write the balanced equation and state two observations.
B. What does this show about the relative reactivity of iron and copper?

26. Students to attempt either option A or B. **3**
A. (i) Explain, with the help of micelle formation, how soap removes oily dirt. (ii) Why is a larger amount of soap needed for washing in hard water, and how do detergents overcome this?
OR
B. (i) What is a homologous series? (ii) Write the molecular formulae and names of the second and third members of the alkene series. (iii) Why do members of a homologous series show similar chemical properties but gradually varying physical properties?

27. Give reasons for the following: **3**
A. Calcium starts floating when it reacts with water.
B. Ionic compounds conduct electricity in the molten state but not in the solid state.
C. Hydrogen gas is not usually evolved when a metal reacts with nitric acid.

28. **Case study:** At an orthopaedic clinic, a doctor mixes a white powder with water and wraps it around a fractured arm; within minutes it sets into a hard mass that holds the bone in place. The powder is made by heating a naturally occurring salt that contains two molecules of water of crystallisation. Unused powder is kept in an air-tight container. **4**

A. Name the white powder and write its chemical formula. **(1)**

B. Write the chemical equation for the setting of the powder with water. **(1)**

Attempt either sub-part C or D.

C. How is the powder prepared from the naturally occurring salt? Write the equation and explain why it is stored in an air-tight container. **(2)**

OR

D. Why is only half a water molecule shown in the formula of the powder? Give two other uses of this powder. **(2)**

29. Students to attempt either option A or B. **5**

A. I. Identify the type of each reaction: (i) $CaCO_3 \rightarrow CaO + CO_2$ on heating; (ii) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$; (iii) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$; (iv) $CaO + H_2O \rightarrow Ca(OH)_2$. **(2)**

II. In $ZnO + C \rightarrow Zn + CO$, identify the substance oxidised and the substance reduced, giving reasons. **(1½)**

III. What is corrosion? Give one example other than rusting of iron. **(1½)**

OR

B. I. Show the formation of sodium oxide (Na_2O) by the transfer of electrons. (Atomic numbers: Na = 11, O = 8) **(2)**

II. Why do ionic compounds have high melting points and why are they hard? **(1½)**

III. What are amphoteric oxides? Write the equations showing the reaction of aluminium oxide with an acid and with a base. **(1½)**

SECTION – C (PHYSICS)

Questions 30 to 39

30. The figure shows a ray of light passing through a rectangular glass slab. Which relation between the marked angles is correct? **1**

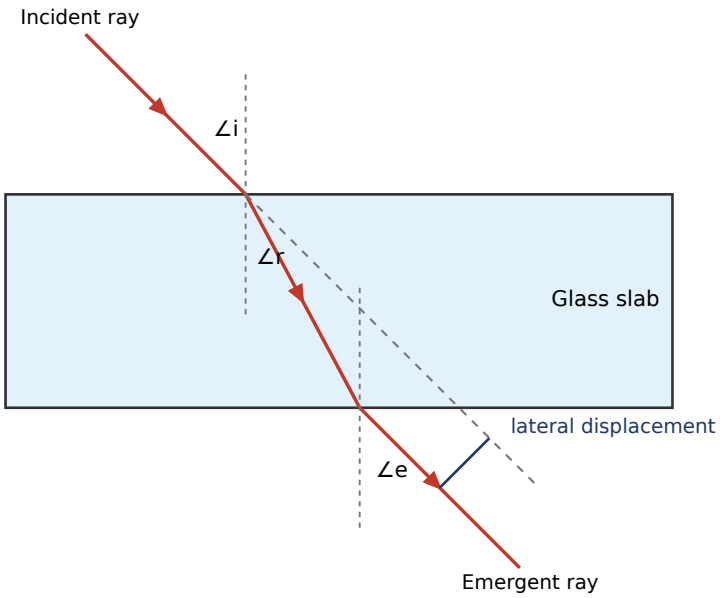


Figure: Refraction through a rectangular glass slab

A. ∠i = ∠e

B. ∠i = ∠r

C. ∠r = ∠e

D. ∠i < ∠r

31. A 100 W bulb is used for 10 hours. The electrical energy consumed is **1**

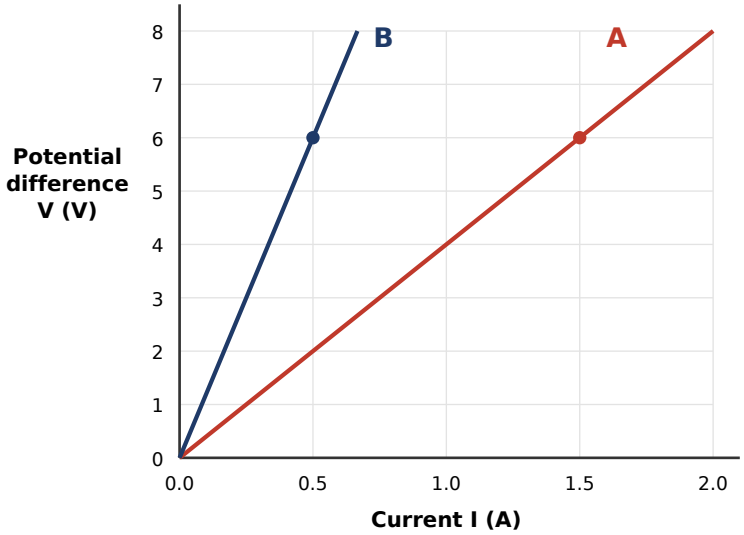
A. 0.1 kW h
B. 1 kW h
C. 10 kW h
D. 1000 kW h

The following question(s) consist of two statements – Assertion (A) and Reason (R). Answer 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.

32. **Assertion (A):** Copper wires are commonly used for household electrical wiring. **1**
Reason (R): Copper has a very low electrical resistivity.

33. The V–I graphs of two wires A and B are shown. **2**



V–I graphs for two wires A and B at the same temperature

A. Find the resistance of each wire.
B. If the two wires are of the same material and the same thickness, which one is longer, and by how many times?

34. Students to attempt either option A or B. **2**
A. Why do stars twinkle while planets do not?
OR
B. Why does the clear sky appear blue? Why are 'danger' signal lights red in colour?

35. An object 6 cm tall is placed 20 cm in front of a convex mirror of focal length 30 cm. Find the position, size and nature of the image. **3**

36. An electric heater draws a current of 4 A from a 220 V supply. **3**
A. Find its power and its resistance.
B. Calculate the heat produced in 30 minutes, in joules and in kW h.

37. In the circuit shown, a 12 V battery is connected to $R_1 = 2\ \Omega$ in series with a parallel combination of $R_2 = 6\ \Omega$ and $R_3 = 3\ \Omega$. **3**

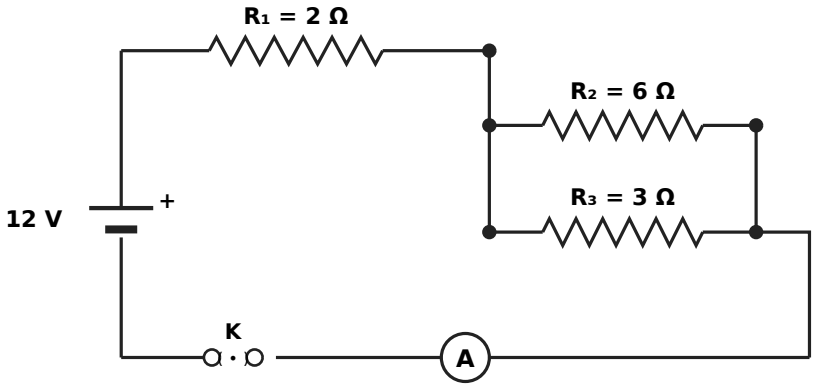
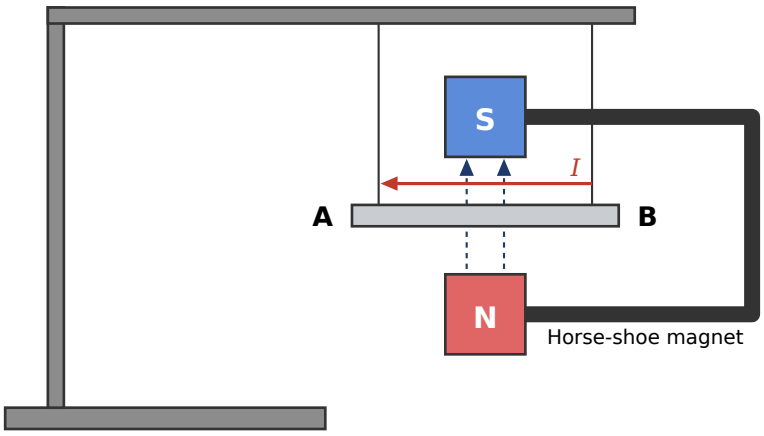


Figure: Circuit for Question 37

A. Find the current drawn from the battery.

B. Find the power dissipated in each resistor and show that their sum equals the power supplied by the battery.

38. **Case study:** A small aluminium rod AB is suspended horizontally between the poles of a strong horse-shoe magnet so that the magnetic field is vertical, as shown. The ends of the rod are connected to a battery, a key and a rheostat. **4**



Field vertically upward; current from B to A (battery, key and rheostat not shown)

A. What will be observed when the key is closed? Why? **(1)**

B. What happens if the direction of the current is reversed? **(1)**

Attempt either sub-part C or D.

C. State Fleming's left-hand rule. How will the displacement of the rod change if the rheostat is adjusted to increase the current? **(2)**

OR

D. If the rod were placed parallel to the magnetic field, what would be the force on it? When is the force on the rod the greatest? Name two devices that use current-carrying conductors in magnetic fields. **(2)**

39. Students to attempt either option A or B. **5**

A. I. An object 4 cm tall is placed 10 cm in front of a convex lens of focal length 15 cm. Find the position, size and nature of the image. **(2½)**

II. Define 1 dioptre and find the power of this lens. **(1)**

III. The refractive index of glass is 1.5. What does this mean? Find the speed of light in glass ($c = 3 \times 10^8$ m s^{-1}). **(1½)**

OR

B. I. State Ohm's law. On what factors does the resistance of a conductor depend? **(2)**

II. Three resistors of 2 Ω, 3 Ω and 6 Ω are connected in parallel to a 6 V battery. Find the equivalent resistance, the total current and the current through each resistor. **(3)**