Science (086)

CBSE Class 10 Board Examination 2027 – Practice Paper No. 1

Practice Question Paper

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

(1) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(2) 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.

(3) Marks for each question are shown against it. Draw neat, labelled diagrams wherever required.

SECTION A – BIOLOGY (Q.1 to Q.7) Multiple choice questions. Select the correct option. (1 mark each) **[7]**

1 Which one of the following events does **NOT** take place during photosynthesis?

(A) Absorption of light energy by chlorophyll

(B) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen

(C) Reduction of carbon dioxide to carbohydrates

(D) Breakdown of glucose into pyruvate in the cytoplasm

2 During a 400 m race on sports day, Aditya felt painful cramps in his leg muscles. These cramps are caused by the build-up of:

(A) ethanol and carbon dioxide

(B) carbon dioxide and water

(C) lactic acid

(D) glucose

3 During a long dry spell in Marathwada, the leaves of a bajra crop were seen wilting. Which plant hormone inhibits growth and has wilting of leaves among its effects?

(A) Auxin

(B) Gibberellin

(C) Cytokinin

(D) Abscisic acid

4 After fertilisation in a flower of a brinjal plant, the ovules and the ovary respectively develop into:

(A) fruit and seed

(B) seed and fruit

(C) embryo and seed coat

(D) pollen tube and seed

5 A couple in Latur has two daughters. Some relatives blame the mother for not having a son. Which statement correctly explains how the sex of a human child is decided?

(A) The mother's egg decides it, because an egg may carry either an X or a Y chromosome.

(B) It depends on whether the sperm that fertilises the egg carries an X or a Y chromosome.

(C) It depends on the temperature at which the fertilised egg develops.

(D) A daughter inherits both her X chromosomes from her mother.

6 Which one of the following statements about ozone is correct?

(A) Ozone in the higher levels of the atmosphere is formed when UV radiation splits O_2 molecules into free oxygen atoms, which then combine with O_2.

(B) A molecule of ozone is made up of two atoms of oxygen.

(C) The ozone layer is being depleted mainly by carbon dioxide released from vehicles.

(D) Ozone at ground level is harmless and useful to living organisms.

7 Which one of the following methods of contraception also helps to protect against sexually transmitted diseases such as HIV-AIDS?

(A) Copper-T
(B) Oral pills
(C) Condom
(D) Vasectomy

Q.8 – Q.9 Assertion–Reason. Each question has two statements – Assertion (A) and Reason (R). Select the appropriate option (A), (B), (C) or (D) given below the question. (1 mark each) **[2]**

8 **Assertion (A):** In human beings, the right side of the heart receives oxygenated blood from the lungs.

Reason (R): In mammals, blood passes through the heart twice during each cycle of circulation.

(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.

9 **Assertion (A):** In an ecosystem, the flow of energy is unidirectional.

Reason (R): The energy captured by green plants passes on to herbivores and then to carnivores, but it never passes back from a higher trophic level to a lower one or to the solar input.

(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.

Q.10 – Q.12 Answer the following questions. (2 marks each) **[6]**

10 While making chapatis, Sana's hand touched a hot tawa and she pulled it away at once, even before she felt the pain.

(a) What is such a quick response called? Trace the path followed by the message from her skin to the muscles of her arm.

(b) Why is it useful that this response is controlled by the spinal cord and not by the thinking part of the brain?

11 **Attempt either option A or B.**

A. On a hot, dry afternoon a student observed under the microscope that most of the stomatal pores in a leaf peel of a plant were closed.

(a) Which cells control the opening and closing of a stomatal pore? How do they do it?

(b) How does closing the pores at such a time help the plant?

OR

B. A slice of bread left in a warm, moist kitchen for a few days was covered with a white, cottony growth with tiny black dots.

(a) Name the organism and the method by which it reproduces. What are the tiny black dots?

(b) Why did a dry slice of bread kept in the same kitchen not show this growth?

12 A farmer in Satara crossed pure-breeding pea plants having round seeds with pure-breeding pea plants having wrinkled seeds. All the F_1 plants produced round seeds. When the F_1 plants were self-pollinated, 1200 seeds were obtained in the F_2 generation.

(a) Which trait is dominant? Give a reason.

(b) Using suitable symbols, show the $F_1 \times F_1$ cross and find how many of the F_2 seeds are expected to be wrinkled.

Q.13 – Q.14 Answer the following questions. (3 marks each) **[6]**

13 A mango sapling about 2 m tall is growing in a large pot on a terrace in Nashik. It is watered every evening, and it makes food in its leaves.

(a) Name the tissues that transport (i) water and minerals and (ii) food in the plant.

(b) Water rises up the stem much faster on a sunny afternoon than at night. Explain why.

(c) Suppose a complete ring of bark, including the phloem, is removed from the stem near its base, leaving the xylem intact. Which transport will be affected – of water to the leaves or of food to the roots? Give a reason.

14 The residents of a housing society in Pune collected the following waste in one week: vegetable peels, plastic milk pouches, dry leaves, glass bottles, old newspapers and aluminium foil.

(a) Classify these wastes into biodegradable and non-biodegradable.

(b) Why should the plastic milk pouches never be put into the compost pit along with the vegetable peels?

(c) The society wants to make manure for its garden on its own premises. Which of the above wastes can be used, and why?

Q.15 Case-based question. (4 marks) **[4]**

15 Fourteen-year-old Pooja lives in a hilly village where most of the food is grown locally. She noticed a swelling in her neck. The doctor at the primary health centre said it was goitre and advised the family to use iodised salt. Pooja's grandfather visits the same doctor because he has a high level of sugar in his blood; he has been asked to control his diet and take medicines regularly.

(A) Which hormone is not being made in sufficient amount in Pooja's body? Why is iodine needed for it? (1)

(B) Name the hormone whose deficiency causes the grandfather's condition, and the gland that secretes it. (1)

Attempt either sub-part C or D.

(C) Explain how the timing and amount of the hormone named in (B) released into the blood are regulated. (2)

OR

(D) One morning a stray dog suddenly chased Pooja on her way to school and her heart began to beat very fast. Name the hormone and the gland responsible, and describe two changes this hormone brings about to prepare her body to deal with the situation. (2)

Q.16 Long answer question. (5 marks) **[5]**

16 **Attempt either option A or B.**

A. With reference to reproduction in human beings:

I. Name the part of the female reproductive system where (a) fertilisation of the egg takes place and (b) the fertilised egg (zygote) gets implanted. (1)

II. The embryo growing inside the mother's body cannot take in food or oxygen on its own, and the blood of the mother does not flow into the embryo. Name the special tissue through which the embryo obtains glucose and oxygen, and describe how its structure helps in the exchange of materials between the mother and the embryo. (2)

III. About how long does the development of the child inside the mother's body take, and how is the child born at the end of this period? (1)

IV. Why are the testes located outside the abdominal cavity, in the scrotum? (1)

OR

B. With reference to nutrition in human beings:

I. Name the three substances secreted by the gastric glands in the wall of the stomach. (1)

II. The enzyme pepsin can act only in an acidic medium. Which substance secreted in the stomach provides this medium, and why is the inner lining of the stomach normally not harmed by it? (1)

III. Name the enzymes present in pancreatic juice that digest (a) proteins and (b) fats. (1)

IV. In a certain disease, the finger-like projections on the inner lining of the small intestine become damaged and flattened. The patient becomes weak even though he eats enough food. Name these projections and explain why the patient becomes weak. (2)

SECTION B – CHEMISTRY (Q.17 to Q.23) Multiple choice questions. Select the correct option. (1 mark each) **[7]**

17 A few drops of silver nitrate solution were added to a sample of salty well water from a coastal village. A white, insoluble substance formed at once:

$AgNO_3(aq) + NaCl(aq) \rightarrow AgCl(s) + NaNO_3(aq)$

This reaction is an example of:

(A) a combination reaction

(B) a decomposition reaction

(C) a displacement reaction

(D) a double displacement (precipitation) reaction

18 The pH values of four solutions are given below.

Solution	pH
Lemon juice	2.2
Pure water	7.0
Baking soda solution	8.3
Sodium hydroxide solution	13.5

Which one of the following statements is correct?

(A) Baking soda solution turns blue litmus red.

(B) Lemon juice has the highest concentration of hydrogen ions.

(C) Sodium hydroxide solution has the highest concentration of hydrogen ions.

(D) Pure water turns red litmus blue.

19 A student set up four test tubes as follows:
(i) magnesium ribbon in copper sulphate solution
(ii) iron nail in zinc sulphate solution
(iii) zinc granules in copper sulphate solution
(iv) lead strip in iron(II) sulphate solution
In which test tubes will a displacement reaction take place?

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

20 The correct IUPAC name of the compound $CH_3–CH_2–CH_2–CHO$ is:

(A) Butanal (B) Butanone
(C) Butanol (D) Butanoic acid

21 A baker in Kolhapur adds a white powder, made by mixing a mild edible acid such as tartaric acid with compound X, to cake batter. On heating, gas Y is released, which makes the cake soft and spongy. X and Y are:

(A) sodium carbonate and hydrogen (B) sodium hydrogencarbonate and hydrogen
(C) calcium sulphate hemihydrate and carbon dioxide (D) sodium hydrogencarbonate and carbon dioxide

22 Consider the reaction: $H_2S + Cl_2 \rightarrow 2HCl + S$
Which one of the following statements is correct?

(A) H_2S is oxidised and Cl_2 is reduced. (B) H_2S is reduced and Cl_2 is oxidised.
(C) Both H_2S and Cl_2 are oxidised. (D) It is not a redox reaction, because no oxygen is involved.

23 A compound X has a high melting point, is soluble in water but insoluble in kerosene, and conducts electricity in the molten state but not in the solid state. X is most likely to be:

(A) carbon tetrachloride (B) glucose
(C) magnesium chloride (D) ethanol

Q.24 Assertion–Reason. Each question has two statements – Assertion (A) and Reason (R). Select the appropriate option (A), (B), (C) or (D) given below the question. (1 mark) **[1]**

24 **Assertion (A):** Pure ethanoic acid is often called glacial acetic acid.
Reason (R): A 5–8% solution of ethanoic acid in water is called vinegar.

(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.

Q.25 Answer the following question. (2 marks) **[2]**

25 Reena added dilute nitric acid to zinc granules, expecting to collect hydrogen gas as she had done with dilute hydrochloric acid. No hydrogen gas was collected.
(a) Explain why hydrogen gas is not evolved when a metal reacts with nitric acid.
(b) Name two metals that do give hydrogen gas with very dilute nitric acid.

Q.26 – Q.27 Answer the following questions. (3 marks each) **[6]**

26 **Attempt either option A or B.**

A. An organic compound P (molecular formula $C_2H_4O_2$) is used as a preservative in pickles.

(i) Name P and write its functional group.

(ii) What will you observe when P is added to sodium hydrogencarbonate? Write the balanced chemical equation and state how you will test the gas evolved.

(iii) What happens when P reacts with sodium hydroxide solution? Write the equation, name the salt formed and the type of reaction.

OR

B. An open-chain hydrocarbon Y has the molecular formula C_3H_6.

(i) Is Y a saturated or an unsaturated hydrocarbon? Draw its structural formula and give its IUPAC name.

(ii) Y and propane (C_3H_8) are burnt separately in air. One of them burns with a clean blue flame and the other with a yellow, sooty flame. Which one gives the sooty flame? Write the balanced chemical equation for the complete combustion of propane.

(iii) Propane reacts with chlorine in the presence of sunlight. Name the type of reaction and write the equation for the formation of one product.

27 Give reasons for the following:

(a) Riya's dentist advises her to brush her teeth after eating chocolates and sweets.

(b) When Riya's younger brother was stung by a red ant, their mother applied a paste of baking soda on the spot.

(c) After a heavy, spicy meal, Riya's grandmother complained of pain and a burning feeling in her stomach. The doctor advised her to take milk of magnesia and not a fizzy lemon drink.

Q.28 Case-based question. (4 marks) **[4]**

28 Rajasthan has large deposits of zinc blende (ZnS), an ore of zinc. The flow chart shows the main steps used to obtain pure zinc from it.

(A) Name the process used in Step 2 and write the balanced chemical equation for it. (1)

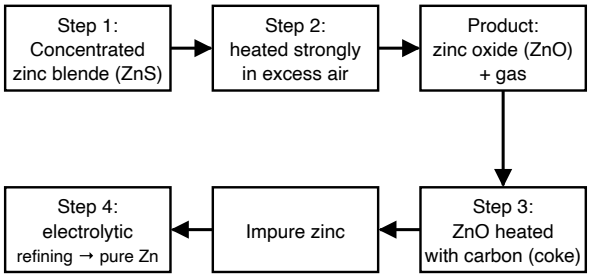
(B) Write the chemical equation for Step 3 and identify the reducing agent. (1)

Attempt either sub-part C or D.

(C) Another mine supplies an ore that contains zinc carbonate ($ZnCO_3$). How must Step 2 be changed for this ore? Name the new process, write its equation and state how the supply of air differs from that in Step 2. (2)

OR

(D) Aluminium oxide cannot be reduced to aluminium by heating it with carbon as in Step 3. Explain why, and name the method used to obtain such metals. Write the reaction taking place at the cathode when sodium is obtained from molten sodium chloride by this method. (2)



Q.29 Long answer question. (5 marks) **[5]**

29 **Attempt either option A or B.**

A.

I. Balance the following skeletal equations and state the type of each reaction: (3)

(i) $Mg + AgNO_3 \rightarrow Mg(NO_3)_2 + Ag$

(ii) $Fe_2O_3 + CO \rightarrow Fe + CO_2$ (also name the substance oxidised and the substance reduced)

(iii) $AlCl_3 + NaOH \rightarrow Al(OH)_3 + NaCl$ (a white precipitate forms)

II. (a) When dilute hydrochloric acid is added to sodium hydroxide solution in a test tube, the test tube becomes warm. Name the type of reaction and state whether it is exothermic or endothermic. (1)

(b) Classify as exothermic or endothermic: (i) burning of LPG in a kitchen stove; (ii) decomposition of calcium carbonate into quicklime in a lime kiln. (1)

OR

B.

I. Sculptors in Pen (Raigad district) make Ganesh idols from a white powder Y which, on mixing with water, sets into a hard solid mass. Y is obtained by heating gypsum at 373 K.

(a) Name Y and write its chemical formula. (1)

(b) Write the chemical equation for the preparation of Y from gypsum. (1)

(c) When the sculptors mix Y with water and pour it into a mould, it sets into a hard idol within a short time. Name the substance formed and write the chemical equation for this change. (1)

II. (a) What is meant by water of crystallisation? Write the chemical formula of washing soda to show it. (1)

(b) Give one use of washing soda other than as a cleaning agent. (1)

SECTION C – PHYSICS (Q.30 to Q.31) Multiple choice questions. Select the correct option. (1 mark each) **[2]**

30 A large mirror is fixed at a sharp bend on a ghat road so that drivers can see vehicles coming from the other side. The mirror is convex. The image formed by it is always:

(A) real, inverted and diminished
(B) virtual, erect and diminished
(C) virtual, erect and enlarged
(D) real, erect and of the same size

31 Two wires P and Q are made of the same copper. Wire Q is twice as long as wire P and has twice the diameter of P. The ratio of the resistance of Q to that of P is:

(A) 1 : 2
(B) 2 : 1
(C) 1 : 4
(D) 4 : 1

Q.32 Assertion–Reason. Each question has two statements – Assertion (A) and Reason (R). Select the appropriate option (A), (B), (C) or (D) given below the question. (1 mark) **[1]**

32 **Assertion (A):** The sky appears blue on a clear day.
Reason (R): Blue light has a longer wavelength than red light, so it is scattered more by the particles in the atmosphere.

(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.

Q.33 – Q.34 Answer the following questions. (2 marks each) **[4]**

33 A candle flame is placed 30 cm in front of a thin lens. A sharp image of the flame is obtained on a screen placed 60 cm behind the lens.

(a) Is the lens converging or diverging? Give a reason.

(b) Find the focal length and the power of the lens.

34 **Attempt either option A or B.**

A. I. Why is the wire of an electric fuse made of a material of low melting point, and how is the fuse connected with the device it protects?

II. The heating element of an electric geyser produces 1.32×10^6 J of heat in 10 minutes when a current of 10 A flows through it. Calculate the resistance of the element.

OR

B. A straight horizontal wire carries a current from east to west in a magnetic field that is directed vertically downward, as shown in the figure (top view).

I. State Fleming's left-hand rule.

II. Using the rule, find the direction of the force acting on the wire.

Top view (looking down from above)



× : magnetic field vertically downward (into the page)

Q.35 – Q.37 Answer the following questions. (3 marks each) **[9]**

35 A jeweller uses a concave mirror of focal length 4 cm to inspect the fine engraving on a ring placed 3 cm in front of the mirror.

(a) Find the position of the image.

(b) Find the magnification and state the nature of the image.

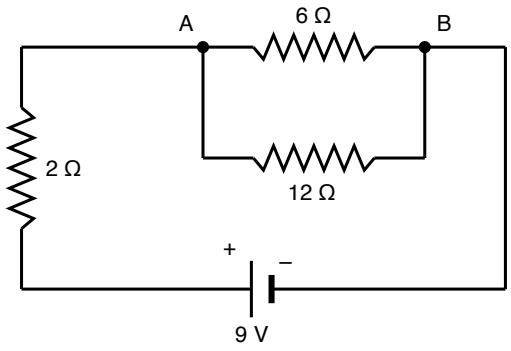
(c) Why is a concave mirror, and not a convex mirror, suitable for this purpose?

36 In the circuit shown, a 9 V battery is connected to a 2 Ω resistor in series with a parallel combination of 6 Ω and 12 Ω resistors. Neglect the resistance of the battery and the connecting wires.

(a) Find the equivalent resistance of the circuit.

(b) Find the current drawn from the battery and the potential difference across the 2 Ω resistor.

(c) Find the current through the 6 Ω and the 12 Ω resistors.



37 Mr. Kulkarni plugs a 2200 W induction cooktop and an 880 W microwave oven, through a multi-plug adaptor, into a single kitchen socket that is on the 5 A circuit of his house. The supply voltage is 220 V.

(a) What is the maximum power that can be drawn safely from this 5 A circuit? Find the total current when both appliances work together, and state what will happen to the fuse of this circuit.

(b) Houses commonly have circuits of 5 A and 15 A current rating. Which of the two appliances can be used safely on the 5 A circuit, and which one must be connected to the 15 A circuit? Support your answer with a calculation.

(c) Name the wire, and the colour of its insulation, that must be connected to the metal body of the cooktop for the user's safety.

Q.38 Case-based question. (4 marks) **[4]**

38 The Deshmukh family in Nashik uses the following electrical appliances every day. The electricity board charges ₹ 8 per unit (kWh).

Appliance	Number	Power of each	Use per day
LED bulb	5	10 W	6 h
Ceiling fan	2	50 W	8 h
Television	1	100 W	4 h

They also have an electric iron rated 880 W, 220 V.

(A) What is meant by 1 unit of electrical energy? Express it in joules. (1)

(B) Calculate the current drawn by the iron and its resistance when it is operated at 220 V. (1)

Attempt either sub-part C or D.

(C) Calculate the electrical energy consumed by the bulbs, fans and television in 30 days, and the cost of this energy. (2)

OR

(D) Earlier the family used five 40 W filament bulbs in place of the 10 W LED bulbs, for the same 6 hours a day. How many extra units did the bulbs consume in 30 days, and how much extra did the family pay? (2)

Q.39 Long answer question. Attempt either option (A) or (B). (5 marks) **[5]**

(A) Seventy-year-old Mr. Patil can see distant hills clearly, but he can no longer read a newspaper held at 25 cm from his eyes; he has to hold it much farther away. His granddaughter Riya, a Class 10 student, reads her book easily but cannot read the writing on the blackboard clearly from the last bench.

I. Name the defect of vision Riya has. Where is the image of the blackboard formed in her eye? (1)

II. Mr. Patil's defect is caused by ageing. Name this defect and state its cause. (1)

III. A few years later Mr. Patil also finds it difficult to see distant objects clearly. What type of spectacle lenses will he then need? Describe the two parts of such a lens. (1)

IV. Difficulty in seeing nearby objects is corrected in the same way as hypermetropia. Draw ray diagrams to show (a) how a hypermetropic eye forms the image of an object placed at N, the near point of a normal eye, and (b) how this defect is corrected. (2)

OR

(B) Light travels through a transparent plastic at a speed of 1.8×10^8 m/s. (Speed of light in vacuum = 3×10^8 m/s)

I. Find the refractive index of the plastic. (1)

II. A ray of light passes obliquely from air into this plastic. Will it bend towards or away from the normal? Give a reason. (1)

III. Draw a labelled ray diagram to show the refraction of a ray of light through a rectangular glass slab. Mark the angle of incidence, angle of refraction, angle of emergence and the lateral displacement. (2)

IV. Why is the emergent ray parallel to the incident ray in the case of a rectangular glass slab? (1)

All the best for your exam!