

Ritika
16.10.2026
Durga
16/10/26
Rishi
16/10/26

BHARTIYA SHIKSHA BOARD

SAMPLE QUESTION PAPER

CLASS IX

SESSION: 2026-27

Roll No. /रोल नं.

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Code No. 033

Candidates must write the code on the title page of the answer book.

SCIENCE

General Instructions:

Read the following instructions very carefully and strictly follow them.

Time allowed: 3 hours

Maximum Marks: 80

Note:

- (i) Please check that this question paper contains 9 printed pages.
- (ii) Code number given on the right hand side of the question paper should be written on the title-page of the answer-book by the candidate.
- (iii) Please check that this question paper contains **39** questions. All questions are compulsory.
- (iv) Please write down the Serial Number of the question in the answer-book before attempting it.
- (v) **15 Minutes** time has been allotted to read this question paper. The question paper will be distributed at **10:15 a.m.**, From **10:15 a.m.** to **10:30 a.m.**, the students will read the question paper only and will not write any answer on the answer-book during this period.
- (vi) This Question paper comprises of 5 sections – Section A, Section B, Section C, Section D, and Section E. All questions are compulsory.
- (vii) **Section A:** Question No. **1** to **20**, all questions are of one mark each. This section comprises of 16 Multiple Choice Questions (MCQs) type questions and 04 Assertion-Reason type questions. Answer to these questions should be given in one word or one sentence.

- (viii) **Section B:** Question No. **21 to 26** are very short answer (VSA) type questions, carrying **2 marks each**. Answer to these questions should not exceed **30 to 50 words**.
- (ix) **Section C:** Question No. **27 to 33** are short answer type questions, carrying **3 marks each**. Answer to these questions should not exceed **50 to 80 words**.
- (x) **Section D:** Question No. **34 to 36** are long answer type questions, carrying **5 marks each**. Answer to these questions should not exceed **80 to 120 words**.
- (xi) **Section E:** Question No. **37 to 39** are **3** source based/case based units of assessment of **4 marks each** with sub parts.
- (xii) Answer should be in brief and to the point and also, the above mentioned word-limit be adhered to as far as possible.
- (xiii) There is no overall choice in the question paper. However, internal choice has been provided in some questions in each sections. Only one of the choices in such questions have to be attempted.
- (xiv) In addition to this, separate instructions are given with each question wherever necessary.

Section A: Question No. 1 to 20 (1 Mark each)

1. Two atoms have the same number of protons but different numbers of neutrons. They are called:

(a) isobars.	(b) isotones.
(c) isotopes.	(d) ions.
2. Which observation from Rutherford's Gold Foil Experiment suggested that most of the atom is empty space?
 - (a) All alpha particles were reflected.
 - (b) Alpha particles passed straight through the foil.
 - (c) Electrons emitted light.
 - (d) Gold foil melted.
3. A screw gauge has a pitch of 0.5 mm and 100 divisions on its circular scale. Its least count is:

(a) 0.5 mm.	(b) 0.05 mm.
(c) 0.005 mm.	(d) 0.01 mm.
4. In a graph showing how the distance travelled by an ant changes with time, which quantity should normally be represented on the horizontal axis?

(a) Distance	(b) Time
(c) Speed	(d) Acceleration

5. A wooden block just starts moving when a horizontal force of 18 N is applied to it. The limiting friction acting on the block is:
 - (a) 0 N.
 - (b) 9 N.
 - (c) 18 N.
 - (d) More than 18 N.
6. A driver uses a convex mirror as a rear-view mirror because it forms an image that is:
 - (a) real, inverted and enlarged.
 - (b) virtual, erect and diminished.
 - (c) real, erect and diminished.
 - (d) virtual, inverted and enlarged.
7. Choose the incorrect statement.
 - (a) Some organisms placed in the kingdom Fungi can perform photosynthesis.
 - (b) All organisms placed in the kingdom Protista are eukaryotic.
 - (c) Some organisms placed in the kingdom Monera are autotrophs.
 - (d) None of the organisms placed in the kingdom Animalia have cell walls.
8. Which of the following plants is not found in Rajasthan?
 - (a) *Portulaca bharat*
 - (b) Kikar
 - (c) Cactus
 - (d) Chir
9. A pond with fish, plants, insects, water, and sunlight together form a/an:
 - (a) habitat.
 - (b) ecosystem.
 - (c) biome.
 - (d) population.
10. Which of the following molecules bind to red blood cells and determine the blood group?
 - (a) Fats
 - (b) Proteins
 - (c) Sugars
 - (d) Amino acids
11. Which statement about red blood cells is incorrect?
 - (a) They carry oxygen.
 - (b) They contain haemoglobin.
 - (c) They do not have a nucleus.
 - (d) They help in clotting.
12. Which of the following is a polysaccharide?
 - (a) Glucose
 - (b) Fructose
 - (c) Sucrose
 - (d) Cellulose

MCQ (More than one option is correct)

13. Choose the correct statements about atomic structure from the following:
 - (a) Atomic number equals number of protons.
 - (b) Mass number equals protons + neutrons.

- (c) Neutral atoms have equal numbers of protons and electrons.
(d) Number of neutrons always equals number of protons.
14. Which of the following statements about electrons are correct?
(a) They carry negative charge.
(b) They are present inside the nucleus.
(c) They occupy shells around the nucleus.
(d) They determine chemical behaviour.
15. Identify the compounds having polyatomic ions in them?
(a) NaOH (b) NH_4Cl
(c) MgSO_4 (d) NaCl
16. Some of the facts about ionic compounds are given below? Choose the correct options.
(a) Formed by transfer of electrons.
(b) Usually have high melting points.
(c) Conduct electricity in molten or aqueous state.
(d) Consist of neutral molecules held by shared electrons.

Question No. 17-20 are Assertion-Reasoning based Questions

For Assertion-Reason questions, choose the correct options from below:

- (a) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.
(b) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
(c) Assertion is true, but Reason is false.
(d) Assertion is false, but Reason is true.
(e) Both A and R are false
17. **Assertion (A):** The speed of a simple pendulum is maximum at its mean position.
Reason (R): At the extreme positions of its oscillation, the speed of the pendulum bob becomes zero.
18. **Assertion (A):** The magnetic field is stronger near the ends of a bar magnet than at points farther away from it.
Reason (R): The magnetic field becomes weaker as the distance from the magnet increases.
19. **Assertion (A):** Noble gases are generally chemically unreactive.
Reason (R): Noble gases have completely filled outermost electron shells, making them electronically stable.

20. **Assertion (A):** Transpiration helps in upward movement of water in plants.
Reason(R): Water travels up the root hairs by capillary action.

Section B: Question No. 21 to 26 (2 Marks each)

21. Name the process used to separate a mixture of kerosene oil and water. Explain the process with the help a well labelled diagram.
22. A newly discovered compound is found to have the following properties:
It has a low melting point, does not conduct electricity in solid or molten state, exists as individual molecules.
(a) Predict whether the compound is ionic or covalent.
(b) Give one reason based on its properties to support your answer.
23. A Vernier calliper has 25 Vernier scale divisions equal to 24 main scale divisions. If one main scale division is 0.5 mm, calculate its least count.
24. Calculate the heat required to melt 200 g of ice at 0 °C into water at 0 °C. (Latent heat of fusion of ice = $3.34 \times 10^5 \text{ J kg}^{-1}$)
25. What are the benefits of classifying organisms?
26. Briefly explain the different types of proteins based on structure with examples?

Section C: Question No. 27 to 33 (3 Marks each)

27. A laboratory assistant accidentally mixes:
iron filings + common salt + sand
A student suggests: "Add water first and then filter the mixture."
(a) Explain why this does not provide complete separation.
(b) Design a sequence of separation steps to recover all three components as separately as reasonably possible.
(c) Name the physical property used at each major step.
28. Rutherford's planetary model proposed that electrons revolve around a positively charged nucleus. However, this model had a major limitation related to the stability of the atom.
(a) What difficulty did the planetary model face according to the ideas of classical physics?
(b) What new idea did Bohr introduce to overcome this difficulty?
(c) What happens when an electron moves from a higher energy level to a lower energy level?
29. "Digital communication appears clean, but it contributes to environmental pollution". Justify this statement with reference to email usage and mention two steps to reduce its impact.

30. The time period of a simple pendulum is 2s.
- (a) Calculate its frequency of oscillation.
 - (b) How much time does the bob take to move from one extreme position to the other extreme position?
 - (c) State the position at which the speed of the pendulum bob is maximum.
31. Answer the following:
- (a) What is meant by specific heat capacity?
 - (b) Two substances receive the same amount of heat. Substance A shows a smaller rise in temperature than substance B for the same mass. Which substance has the greater specific heat capacity?
 - (c) Give one reason why understanding heat capacity is important in everyday applications.
32. (a) Diagrammatically explain the differences between food chain and food web.
- (b) What is an Apex predator?
33. What is double circulation of blood? Describe in detail.

Section D: Question No. 34 to 36 (5 Marks each)

34. Consider: $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
- A student has 3.65 g of HCl, and all of it reacts.
- (a) What is the mole ratio of HCl to H_2 ?
 - (b) Calculate the number of moles of HCl in 3.65 g, taking molar mass of HCl as 36.5 g mol^{-1} .
 - (c) Calculate the moles of H_2 produced.
 - (d) Calculate the mass of H_2 produced using molar mass $\text{H}_2 = 2 \text{ g mol}^{-1}$.
 - (e) Explain why the balanced equation was essential for solving the problem.

Or

A reaction in which calcium carbonate is heated produces calcium oxide and carbon dioxide.

A student writes only: $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$

The teacher asks the student to make the equation more informative.

- (a) Write the physical states of the substances.
- (b) Indicate the condition required for the reaction.
- (c) Explain what information is added by the symbols.
- (d) Identify the gaseous product.
- (e) Explain why writing physical states and conditions can be useful in laboratory or industrial situations.

35. A student places a bar magnet beneath a sheet of cardboard and sprinkles iron filings over the cardboard. The filings form a definite pattern around the magnet.

Answer the following:

- (a) Why do the iron filings arrange themselves in chains around the magnet?
- (b) What do these chains represent?
- (c) In which region of the magnet is the magnetic field stronger—near its ends or farther away? Give a reason.
- (d) How can a compass be used to determine the direction of the magnetic field at a point?

Or

A student performs an experiment with a concave mirror. He places the mirror facing a distant object and adjusts a screen until a sharp image is obtained. The distance between the mirror and the screen is found to be 17 cm.

Answer the following:

- (a) What is the focal length of the concave mirror?
 - (b) Calculate its radius of curvature.
 - (c) State the nature of the image formed on the screen.
 - (d) Draw a neat ray diagram showing the formation of the image of a distant object by a concave mirror.
36. Answer the following questions
- (a) Which molecules are osmotically inactive and why?
 - (b) Diagrammatically explain what would happen to a cell kept in
 - (i) Hypertonic solution
 - (ii) Hypotonic solution
 - (iii) Isotonic solution

Or

Differentiate between the following:

- (a) RER and SER
- (b) Chromoplasts and leucoplasts
- (c) Cell wall and cell membrane

Section E: Question No. 37 to 39 (4 Marks each)

37. During a science activity, Ankita took three transparent glasses and added water to each. In Glass A, she dissolved common salt. In Glass B, she added chalk powder. In Glass C, she added a small quantity of milk. She left all three glasses undisturbed for 30 minutes. Glass A remained clear and transparent.

In Glass B, particles settled at the bottom. Glass C remained cloudy, but no visible particles settle(d) The teacher then passed a beam of light through each sample. The beam was not clearly visible in Glass A but could be observed in Glass C.

Answer the following questions based on above information.

- (a) Identify the type of mixture present in Glasses A, B and C.
- (b) Which glass contains particles large enough to settle under gravity? Explain.
- (c) Why can Glass C show the path of a beam of light even though its particles cannot be seen with the naked eye?
- (d) A student says, "Glass C must be a true solution because nothing settles." Do you agree? Give a reason.

Or

A school has two artificial ponds, Pond X and Pond Y. Pond X is shaded by trees and remains relatively cool. Pond Y receives strong sunlight throughout the afternoon and becomes considerably warmer. During summer, the science club observes that aquatic organisms in Pond Y appear to face greater difficulty. The students suggest several explanations:

Student A: "Warm water should contain more dissolved oxygen because particles move faster."

Student B: "The solubility of gases behaves differently from that of most solids."

Student C: "Heating the water may cause some dissolved gas to escape."

Answer the following questions based on the above information.

- (a) Which pond is expected to contain more dissolved oxygen?
 - (b) Identify the error in Student A's reasoning.
 - (c) Explain, at the particle level, why increasing temperature can decrease the solubility of a gas in water.
 - (d) Predict what could happen to aquatic life if Pond Y continues to become warmer. Give a scientific reason.
38. A $400\ \Omega$ resistor is connected to a 9 V battery. Another resistor of $20\ \text{k}\Omega$ is connected in parallel with it.

Answer the following:

- (a) Calculate the current through the $400\ \Omega$ resistor.
- (b) Calculate the current through the $20\ \text{k}\Omega$ resistor.
- (c) Which resistor carries the larger current?
- (d) What happens to the equivalent resistance when a resistor is connected in parallel with another resistor?

Or

Read the following situation carefully and answer the questions that follow.

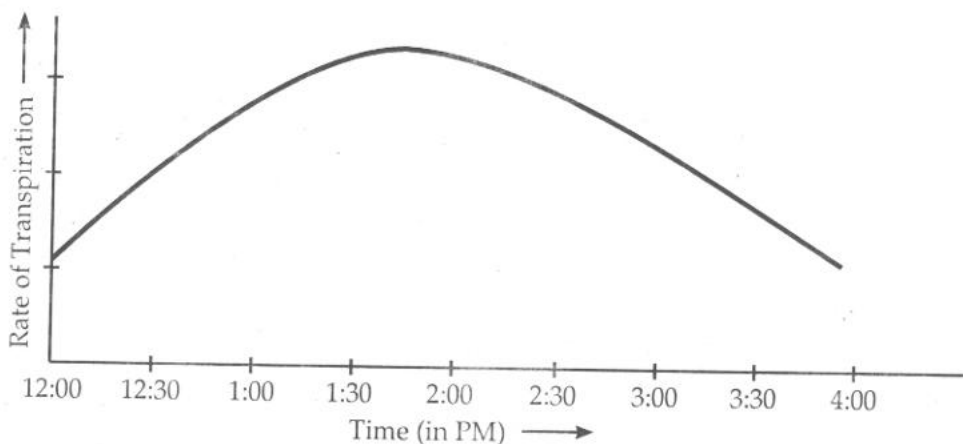
A student pulls a wooden box on a rough horizontal floor using a spring balance. The box starts moving when the spring balance reads 30 N. Once the box is sliding, the spring balance shows a reading of 25 N to keep it moving at a steady speed.

Answer the following:

- (a) What is the limiting friction on the box?
 - (b) Which type of friction acts when the box is sliding?
 - (c) Why is less force required to keep the box moving than the force required to start its motion?
 - (d) In which direction does friction act when the box is sliding?
39. Sita participated in a 200-metre racing competition. She ran very fast and won the first place. However, just after crossing the finish line, she experienced a sharp pain in her leg muscles and on touching, the muscles felt tight.
- (a) Why did Sita experience pain and tightness in her leg muscles after running?
 - (b) What kind of respiration is occurring in the leg muscles?
 - (c) What is the end product of this respiration process?

Or

A potted plant was kept in sunlight on a hot afternoon. Humidity and speed of wind remained nearly constant throughout the observation period. The graph given below shows the rate of transpiration with respect to time.



- (a) At what time was the rate of transpiration highest?
- (b) How were plants able to reduce rate of transpiration?
- (c) What are guard cells and how do they play a role in transpiration?

