

Model Question Paper 1
Half-Yearly Examination 2026-27
SCIENCE

Time Allowed: 3 Hours

Maximum Marks: 80

General Instructions:

1. This question paper has 5 sections: A, B, C, D and E.
2. Section A has 20 objective type questions carrying 1 mark each.
3. Section B has 6 questions carrying 2 marks each. Answers to these should not exceed 40-50 words each.
4. Section C has 7 questions carrying 3 marks each. Answers to these should not exceed 60-80 words each.
5. Section D has 3 questions carrying 5 marks each. Answers to these should not exceed 120 words each.
6. Section E has 3 source/case-based questions carrying 4 marks each with sub-parts.
7. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the choices in such questions.
8. Wherever necessary, neat and labelled diagrams should be drawn.

SECTION A

Question numbers 1 to 20 carry 1 mark each. Choose the most appropriate answer.

1. A student notices that potted plants kept near a window always bend and grow towards the light. Before designing an experiment to test her idea about why this happens, she first writes down a possible, testable explanation. This tentative explanation is called: [1]

- (a) An observation
- (b) A hypothesis
- (c) A conclusion
- (d) Raw data

2. To test fairly whether sunlight affects seed germination, a student keeps two sets of pots exactly alike in soil, water and seed type, changing only whether they receive sunlight. The one factor she deliberately changes (sunlight) is called the: [1]

- (a) Controlled variable
- (b) Independent variable
- (c) Dependent variable
- (d) Constant

3. Which of the following is NOT a microorganism? [1]

- (a) Bacteria
- (b) A moss plant visible to the naked eye
- (c) Protozoa
- (d) Virus

4. To set curd from milk at home, a small spoonful of the previous day's curd (a 'starter') is added to warm milk. This starter mainly contains a large number of: [1]

- (a) Yeast cells
- (b) Lactobacillus bacteria
- (c) Protozoa
- (d) Viruses

5. Viruses are often described as being on the borderline between living and non-living things mainly because they: [1]

- (a) Can walk or swim using tiny legs
- (b) Can multiply only after entering a living host cell
- (c) Have a fully developed cell structure like bacteria
- (d) Can make their own food using sunlight

6. A child who has already suffered from measles once almost never gets measles again. This is because the body's immune system has developed, against that specific pathogen, a: [1]

- (a) Permanent fever
- (b) Memory (immunity)
- (c) New blood group
- (d) Extra layer of skin

7. A doctor tells a patient with an ordinary cold (caused by a virus) that antibiotics will not help him recover faster. This is because antibiotics are effective mainly against: [1]

- (a) Bacteria, not viruses
- (b) Viruses only
- (c) All microorganisms equally
- (d) Only fungal infections

8. Diseases that can spread from an infected person to a healthy person through air, water, food or physical contact are called: [1]

- (a) Deficiency diseases
- (b) Communicable (infectious) diseases
- (c) Non-communicable diseases
- (d) Hereditary diseases

9. An electric iron, a room heater and a toaster all work mainly using the _____ effect of electric current. [1]

- (a) Magnetic
- (b) Heating
- (c) Chemical
- (d) Cooling

10. A crane uses an electromagnet to lift and drop scrap iron by switching the current on and off. Without changing the battery used, its lifting strength can be increased by: [1]

- (a) Reducing the number of turns of coil around the core
- (b) Increasing the number of turns of coil around the iron core
- (c) Replacing the iron core with a wooden core
- (d) Disconnecting the switch

11. In an electric doorbell, pressing the button makes an electromagnet attract an iron strip, which strikes a gong and simultaneously breaks the circuit at that contact point, causing continuous ringing as long as the button is held. This working of the doorbell is mainly based on the: [1]

- (a) Heating effect of current
- (b) Magnetic effect of current
- (c) Chemical effect of current
- (d) Lighting effect of current only

12. A football lying still on the ground begins to move only after a player kicks it. This shows that a force is needed to: [1]

- (a) Change the colour of a body
- (b) Change the state of rest or motion of a body
- (c) Always raise the temperature of a body
- (d) Always act without any contact

13. A fielder catching a fast cricket ball gradually draws his hands backward while catching it, instead of keeping them still. This is done mainly to: [1]

- (a) Increase the force felt on the hands
- (b) Increase the time taken to stop the ball, reducing the force felt
- (c) Reduce friction between the ball and hands
- (d) Apply a non-contact force on the ball

14. A refrigerator magnet sticks firmly to the steel door without the two ever needing to touch beforehand. The force that pulls the magnet towards the door even before contact is a: [1]

- (a) Contact force
- (b) Non-contact (magnetic) force
- (c) Muscular force
- (d) Frictional force

15. Weather bulletins before a cyclone report a very low atmospheric pressure at the storm's centre (the 'eye'), together with very high wind speeds around it. The strong winds occur mainly because: [1]

- (a) Air always moves from a low-pressure region to a high-pressure region
- (b) Air rushes in rapidly from the surrounding high-pressure region towards the low-pressure centre
- (c) Wind speed has no connection with air pressure
- (d) Temperature is always zero at the storm's centre

16. Wind is best described as: [1]

- (a) Air that is completely still
- (b) Air in motion
- (c) Water vapour rising into the sky
- (d) A measure of air pressure alone

17. During a thunderstorm, people are advised not to take shelter under a tall, isolated tree standing alone in an open field. This is mainly because such a tree: [1]

- (a) Is more likely to be struck by lightning, and its branches may also break in strong wind
- (b) Increases the local air pressure dangerously
- (c) Absorbs all the surrounding oxygen
- (d) Always falls due to the cold alone

18. A few drops of perfume released in one corner of a closed room can be smelt throughout the room within a short time, even with no fan or draught blowing. This happens mainly due to: [1]

- (a) Evaporation of the liquid perfume alone
- (b) Diffusion of perfume particles because of their constant random motion
- (c) Condensation of perfume vapour
- (d) The high density of gas particles staying in one place

19. *This question consists of two statements — Assertion (A) and Reason (R). Choose the correct option: [1]*

Assertion (A): A gas can be compressed into a much smaller volume far more easily than a solid or a liquid.

Reason (R): In a gas, the particles are far apart with large empty spaces between them and negligible force of attraction, unlike the closely packed particles of a solid or liquid.

- (a) Both A and R are true, and R is the correct explanation of A
- (b) Both A and R are true, but R is NOT the correct explanation of A
- (c) A is true, but R is false
- (d) A is false, but R is true

20. *This question consists of two statements — Assertion (A) and Reason (R). Choose the correct option: [1]*

Assertion (A): Ice, liquid water and steam look and behave very differently from one another, even though all three are made of exactly the same water particles.

Reason (R): The arrangement, spacing and motion of the particles differ in the solid, liquid and gaseous states, and this difference gives each state its own distinct properties.

- (a) Both A and R are true, and R is the correct explanation of A
- (b) Both A and R are true, but R is NOT the correct explanation of A
- (c) A is true, but R is false
- (d) A is false, but R is true

SECTION B

Question numbers 21 to 26 carry 2 marks each.

21. A student wants to find out whether the colour of a container affects how quickly hot water inside it cools down. State two things (other than the container's colour) that she must keep the same in her trials for it to be a fair test. [2]

22. Bread dough is often left covered in a warm place for some time before baking. Explain, in terms of the microorganism used, why this is done. [2]

23. Two friends cut their hands at the same time while gardening. One cleans the wound and applies an antiseptic before bandaging it; the other simply covers the wound without cleaning it. Explain why the first friend's wound is less likely to get infected. [2]

24. Give one example each of a household appliance that mainly uses (a) the heating effect, and (b) the magnetic effect of electric current. [2]

25. A boy finds it much harder to push a loaded trolley across a rough concrete floor than across a smooth tiled floor. (a) Name the force responsible for this difference. (b) Suggest one way to reduce this force. [2]

26. Explain, in terms of air pressure, why mountaineers climbing very high peaks often find it difficult to breathe and need to carry oxygen cylinders. [2]

SECTION C

Question numbers 27 to 33 carry 3 marks each.

27. A student measures the time taken for a candle to melt down by 1 cm under three different room conditions and repeats each measurement three times. (a) Why did she repeat each measurement three times? (b) What should she do with the three readings before comparing the conditions? [3]
28. Fungi such as bread mould cannot make their own food. Explain how fungi obtain their nutrition, and explain why mould grows readily on stale, moist bread but not on a fresh, dry biscuit kept in the same box. [3]
29. Explain the difference between a vaccine and a medicine such as an antibiotic, using the example of the polio vaccine given to a healthy child compared with antibiotics given to a person already suffering from a bacterial infection. [3]
30. Explain why an electric fuse wire is made of a metal with a low melting point, and describe what happens to it during a short circuit, referring to the heating effect of current. [3]
31. List three effects that a force can produce on an object, giving one everyday example for each. [3]
32. Explain, with reference to air pressure, how sucking on a drinking straw allows a liquid to rise into the mouth. [3]
33. A wet cloth dries much faster on a hot, windy day than on a cool, still day. Explain this observation in terms of the particle nature of matter, referring to the effects of both temperature and moving air on evaporation. [3]

SECTION D

Question numbers 34 to 36 carry 5 marks each.

34. Ravi's grandmother tells him that in her childhood, deadly diseases such as smallpox and polio were common, but today children rarely suffer from them because of a routine health programme followed since infancy. (a) Name this health programme/process. (b) Explain, in your own words, how it protects the body against a specific disease. (c) Define 'immunity'. (d) State one difference between natural immunity and the immunity gained through this programme. [5]

OR

A milk vendor keeps two identical cups of fresh milk — one at room temperature and one in the refrigerator — for the same length of time. By evening, the cup at room temperature has turned sour and curdled, while the refrigerated one is still fresh. (a) Name the type of microorganism mainly responsible for milk turning sour. (b) Explain, in terms of microorganisms, why the milk at room temperature spoiled faster. (c) State one useful application of this same kind of microbial action. (d) Suggest one other common household method (besides refrigeration) used to prevent food spoilage by microorganisms.

35. A student wants to make a simple electromagnet using a long iron nail, insulated copper wire and a battery, to pick up small iron pins. (a) Describe briefly how she should set up this electromagnet. (b) State two ways she can increase its strength without changing the battery. (c) Give one reason why an iron nail (and not a copper rod) is used as the core. (d) Name one practical device (other than a crane) that works using an electromagnet. [5]

OR

A delivery boy pushes two boxes of the same size across a floor — one empty and one filled with books. He finds the loaded box much harder to start moving, and it also stops sooner once he lets go, compared to the empty box. (a) Name the force that opposes the motion of the boxes on the floor. (b) Explain why the loaded box is harder to push than the empty one. (c) Suggest one way the delivery boy could reduce this force to move the loaded box more easily. (d) State one situation from daily life where this same force is actually useful rather than a hindrance.

36. During the rainy season, TV weather reports often announce a 'cyclone warning' for coastal areas, mentioning both very low pressure and very high wind speeds. (a) What is a cyclone? (b) Explain why cyclones are associated with very low atmospheric pressure at their centre. (c) State two precautions people in coastal areas should take when a cyclone warning is issued. (d) Name one instrument used to measure atmospheric pressure. [5]

OR

A sponge cake made with baking powder rises and becomes soft and full of tiny holes when baked, while a chapati dough (without baking powder) stays flat. (a) Explain, using the particle model of matter, what happens inside the cake batter as it bakes. (b) Why does the baked cake become full of tiny holes/pores? (c) Name the physical state of the gas trapped inside the baked cake. (d) State one other everyday example where a change in temperature changes the state of matter.

SECTION E

Question numbers 37 to 39 are source/case-based questions carrying 4 marks each with four sub-parts each.

Case Study 1 — Question 37 [4 Marks]

Sunita's family makes curd at home every day by adding a spoonful of the previous day's curd (called a 'starter') to lukewarm milk and leaving it covered overnight in a warm corner of the kitchen. She noticed that on cold winter nights, the milk sometimes takes much longer to set into curd, and once, when she forgot to cover the vessel, a greenish patch grew on top of the curd after two days.

- (i) Name the microorganism mainly responsible for curdling milk into curd. [1]
- (ii) Why does Sunita's family add a spoonful of the previous day's curd (a starter) to the fresh milk instead of just leaving the milk on its own? [1]
- (iii) Explain why the milk takes longer to set into curd on cold winter nights. [1]
- (iv) What is the greenish patch that grew on the uncovered curd, and suggest one way it could have been prevented? [1]

OR Name one human disease caused by a fungus, and state one general method to prevent fungal growth on stored food.

Case Study 2 — Question 38 [4 Marks]

A hostel warden notices two common appliances used by students: an electric room heater that becomes very hot within seconds of switching on, and an electric bell that rings continuously with a buzzing sound as soon as its switch is pressed. Both work using electric current, but through different effects.

- (i) Which effect of electric current makes the room heater's coil become red hot? [1]
- (ii) Explain briefly why the heater's coil (usually made of an alloy such as nichrome) becomes so hot when current passes through it. [1]
- (iii) Which effect of electric current is mainly responsible for the working of the electric bell? [1]
- (iv) Explain briefly, in sequence, why the electric bell rings continuously as long as its switch is kept pressed, rather than striking just once. [1]

OR Suggest one precaution that should be followed while using an electric room heater to avoid accidents.

Case Study 3 — Question 39 [4 Marks]

Before the onset of a cyclone along the coast, weather scientists observe a sudden and rapid drop in atmospheric pressure recorded on their barometers, along with a sharp increase in wind speed. Coastal fishermen are warned in advance through radio and mobile alerts not to venture into the sea, and residents are advised to move to designated cyclone shelters.

- (i) Name the instrument mentioned in the passage that is used to measure atmospheric pressure. [1]
- (ii) What relationship between air pressure and wind is illustrated by the fact that wind speed increases sharply as atmospheric pressure drops at the cyclone's centre? [1]

(iii) Why are fishermen specifically warned not to venture into the sea before a cyclone? [1]

(iv) Explain why coastal areas are more prone to cyclones than places far inland. [1]

OR Suggest two measures (other than moving to a shelter) that a coastal family can take to prepare for an approaching cyclone.