



# B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS  
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

## ANNUAL EXAMINATION 2025-26 SCIENCE (086) (SET-I)

Class: IX  
Date: 12/02/2026  
Admission no:

Time: 3 hours  
Max Marks: 80  
Roll no:

### General Instructions:

- (i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

Section-A (Biology)		Marks
1	Which of the following organelles is responsible for protein synthesis? a) Mitochondria      b) Ribosomes      c) Lysosomes      d) Golgi apparatus	1
2	The cell wall is present in: a) Animal cells only      b) Plant cells only c) Both plant and animal cells      d) All eukaryotic cells	1
3	Which tissue transports food in plants? a) Xylem      b) Phloem      c) Parenchyma      d) Collenchyma	1
4	Muscle tissue that shows voluntary control is: a) Cardiac muscle      b) Smooth muscle      c) Skeletal muscle      d) Involuntary muscle	1
5	Which of the following is a unicellular organism? a) Hydra      b) Amoeba      c) Earthworm      d) Human	1
6	The process by which water moves across a semi-permeable membrane is called: a) Diffusion      b) Transpiration      c) Osmosis      d) Active transport	1
7.		1

The following question consists of two statements – **Assertion (A)** and **Reason (R)**.

Answer these questions 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.

**Assertion (A):** Mitochondria are known as the powerhouse of the cell.

**Reason (R):** They release energy in the form of ATP during respiration.

8	Which of the following is a macronutrient required by plants? a) Iron      b) Zinc      c) Nitrogen      d) Copper	1
9	Which agricultural practice helps in maintaining soil fertility? a) Irrigation      b) Weeding      c) Crop rotation      d) Harvesting	1
10	Write any two differences between prokaryotic and eukaryotic cells.	2



- 22 The picture shows the symbol for sodium.  $^{23}_{11}\text{Na}$  1  
What can be concluded about sodium from the symbol?  
a) It contains 11 neutrons.  
b) It contains 12 protons.  
c) It contains 12 neutrons.  
d) It contains 34 electrons.

The following question consists of two statements – **Assertion (A)** and **Reason (R)**. Answer these questions by selecting the appropriate option given below:

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D. A is false but R is true.

- 23 Assertion (A): Pure water does not conduct electricity. 1  
Reason (R): Pure water does not contain any ions.  
24 Explain any four physical properties of metals. 2  
25 3  
Explain Isotopes and Isobars with examples.  
26 An element has electronic configuration 2, 8, 7. 3  
(a) What is its atomic number?  
(b) What is its valency?  
(c) Is it metal or non-metal?

**OR**

How many nucleons are present in an atom of Aluminium,  $^{27}_{13}\text{Al}$ ? How many electrons are present in the atom? How many nucleons may be considered as neutrons?

- 27 4  
**Case Study: Atomic Structure and Bohr-Bury Rules**

An atom, often referred to as the smallest unit of matter, is composed of subatomic particles: electrons, protons, and neutrons. Ernest Rutherford discovered the nucleus, while Neils Bohr refined the model by proposing that electrons revolve in discrete orbits called shells (*K,L,M,N...*). The maximum capacity of a shell is given by the formula  $2n^2$ , where '*n*' is the shell number. The electrons in the outermost shell, known as valence electrons, determine the chemical properties and valency of an element.

Based on the above, answer the following questions:

- a) How many neutrons are present in an atom with atomic number 11 and mass number 23?  
b) What is the valency of an element with atomic number 16?  
c) If an element has an atomic number of 7, what will be its electronic configuration, and in which shell will the valence electron reside?

**OR**

- c) Why are atoms electrically neutral, even though they contain charged particles (protons and electrons)?

(a) Write the molecular formula and calculate the molecular mass of the following compounds:

- (i) Sulphuric acid (H=1, S=32, O=16)  
 (ii) Calcium carbonate (Ca=40, C=12, O=16)

(b) Define atomicity. Write the atomicity and molecular formula of:

- (i) Phosphorus  
 (ii) Nitrogen

**OR**

(a) Write down the names of compounds represented by the following formulae:

- (i)  $Al_2(SO_4)_3$       (ii)  $CaCl_2$       (iii)  $K_2SO_4$       (iv)  $NaNO_3$

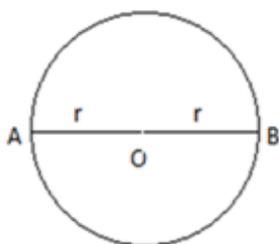
(b) Write the name of the elements present in the following compounds.

- (i) Quick lime  
 (ii) Potassium nitrate  
 (iii) Baking soda

### Section-C (Physics)

29 A particle is moving in a circular path of radius  $r$ .

1



The displacement after half a circle would be:

- (a) Zero      (b)  $\pi r$       (c)  $2r$       (d)  $2\pi r$

30 If the velocity of a body is doubled its kinetic energy

1

- (a) gets doubled (b) becomes half (c) does not change (d) becomes 4 times

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31 **Assertion:** A football has lesser inertia than a stone of the same size.

1

**Reason:** Massive objects have less inertia.

32 Distinguish between speed and velocity.

2

Or

- Aryan went from Delhi to Chandigarh on his bike. The bike's odometer reads 4200 km at the start and 4460 km at the end of the trip. If Aryan took 4 hours and 20 min to complete his journey, find the average speed and velocity in km/h and m/s.
- 33 A sharp knife is more effective than a blunt knife. Why? 2
- 34 What is reverberation? How can it be reduced? 2
- 35 Draw a velocity-time graph for a body that has initial velocity 'u' and is moving with uniform acceleration 'a'. Use it to derive  $v = u + at$ ;  $s = ut + \frac{1}{2} at^2$ , and  $v^2 = u^2 + 2as$  3
- 36 A truck starts from a standing start and rolls downhill with constant acceleration. It covers a distance of 400 m in 20 s. Find its acceleration. Find the force acting on it when its mass is 7 tons (hint: 1 ton = 1000 kg). 3
- 37 What happens to the magnitude of the force of gravitation between two objects if 3
- (a) The distance between the objects is tripled?  
 (b) Mass of both objects is doubled?  
 (c) Mass of both objects as well as distance between them is doubled?
- 38 Case Study: A stone of mass **2 kg** is lifted vertically to a height of **10 m** above the ground. 4
- Questions:
- (i) What type of energy does the stone possess at this height?  
 (ii) Calculate the potential energy of the stone.  
 (iii) On what factors does potential energy depend?  
 (iv) What happens to this energy when the stone falls down?
- 39 (a) How are the wavelength and frequency of a sound wave related to its speed? 5
- (b) Calculate the wavelength of a sound wave with a frequency of 220 Hz and a speed of 440 m/s in a given medium.
- Or
- (a) What are echoes? State the conditions necessary to hear an echo.  
 (b) What are ultrasonic and infrasonic sounds? Mention their applications.

\*\*\*\*\*ALL THE BEST\*\*\*\*\*