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-II)

Class: IX Time: 3 hours
Date:12/02/2026 Max Marks: 80
Admission no: 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)

1 1

The cell organelle responsible for protein synthesis is:

a) Ribosome b) Mitochondria c) Lysosome d) Golgi apparatus

2 1

Which of the following is absent in animal cells?

a) Mitochondria b) Nucleus c) Cell wall d) Ribosomes

3 1

Meristematic tissues are found in:

a) Roots and stems b) Leaves c) Flowers d) Fruits

4 1

Xylem helps in:

a) Transport of food b) Transport of water and minerals
c) Protection d) Storage

5 1

Which of the following is a micronutrient for plants?

a) Nitrogen b) Phosphorus c) Iron d) Potassium

6 1

The process of converting atmospheric nitrogen into usable forms is called:

a) Nitrification b) Denitrification c) Nitrogen fixation d) Ammonification

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): Mitochondria release energy in the form of ATP during respiration.

8 Which of the following organelles is known as the "powerhouse of the cell"? 1
a) Ribosome b) Mitochondria c) Nucleus d) Endoplasmic reticulum

9 Which cell organelle controls all the activities of the cell? 1
a) Cytoplasm b) Vacuole c) Nucleus d) Golgi apparatus

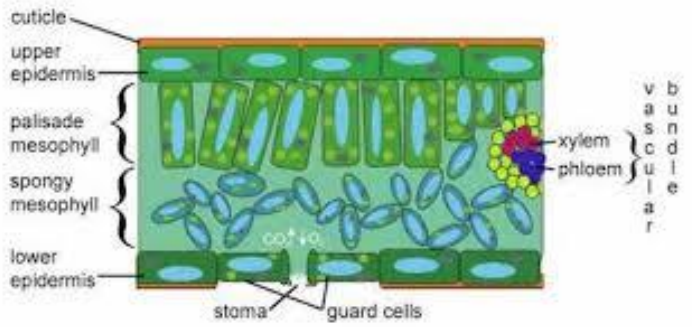
10 Name any two functions of the plasma membrane. 2

11 What is a tissue? 2

12 Differentiate between plant cell and animal cell (any three points). 3

13 Explain mixed cropping and intercropping. 3

14 The leaf is the main photosynthetic organ in a plant. It controls gas exchange and the amount of water loss in plants. Upper epidermal cells contain no chloroplast except the guard cells. They form layers on the upper and lower surface of the leaf. Their function is to prevent water from getting out and stopping unwanted substances/organisms from getting in. The palisade mesophyll layer is where most of the photosynthesis occurs in the leaf. The palisade cells contain a lot of chloroplast to help them perform photosynthesis. Lower epidermis is the bottom layer of the leaf, and is one cell thick. They may not contain a cuticle within the lower epidermis, there are some holes found in leaves called stomata. These holes allow gases to diffuse in and out of the leaves. The stomata are formed by two highly specialized epidermal cells called guard cells. Guard cells are the only epidermal cells that contain chloroplast. 4



(i) Mention the two functions of lower epidermis.
(ii) Where are chloroplasts present in the leaf?
(iii) List one structural and one functional difference between upper and lower epidermis.

OR

(iii) Explain how the structure of guard cells support their function in the leaf.

15 Explain the different methods of crop production management used to improve crop yield. 5

OR

Describe the various types of manures and fertilizers. Explain their advantages and disadvantages.

Section-B (Chemistry)

16 In all the three states of water, (i.e. ice, liquid and vapour) chemical composition of water 1
(a) is very different
(b) remains same
(c) sometimes same and sometimes different
(d) none of the above

17 The solid which undergoes sublimation is ———————— 1
(a) ice cube (b) naphthalene
(c) sodium chloride (d) potassium chloride

18 Common salt is separated from seawater by: 1
(a) Sublimation (b) Evaporation
(c) Filtration (d) Chromatography

19 Which of the following is not a mixture? 1
(a) Brass (b) Distilled water
(c) Ink (d) Soil

20 Which of the following correctly represents 3 molecules of hydrogen? 1
(a) 3H (b) $3H_2$ (c) $2H_2$ (d) H_4

21 All noble gas molecules are 1
(a) Monoatomic (b) Diatomic
(c) Triatomic (d) Both (a) and (b)

22 The atomic number of an element is determined by: 1
(a) Number of neutrons
(b) Number of protons
(c) Number of electrons in outer shell
(d) Mass number

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.

23 Assertion (A): Sea water can be classified as a homogeneous mixture. 1
Reason (R): In sea water, salt is uniformly distributed throughout the water.

24 Differentiate between mixtures and compounds 2

25 (a) Convert 296 K in celsius scale 3
(b) Give reason
(i) Naphthalene balls disappear with time without leaving any solid.
(ii) Water at room temperature is a liquid

26 An element has electronic configuration 2, 8, 2. 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 Boron, $_5^{11}B$? How many electrons are present in the atom? How many nucleons may be considered as neutrons?

27 4

Based on the below passage, answer the following questions:

A number of atoms of some elements have the same atomic number but different mass numbers. For example, hydrogen atom, it has three atomic species, namely Protium, Deuterium and Tritium. The atomic number of each one is 1, but the mass number is 1, 2 and 3, respectively. On the basis of these examples, isotopes are defined as the atoms of the same element, having the same atomic number but different mass numbers. Therefore, we can say that there are three isotopes of hydrogen atom, namely protium, deuterium and tritium.

Many elements consist of a mixture of isotopes. Each isotope of an element is a pure substance. The chemical properties of isotopes are similar but their physical properties are different.

The mass of an atom of any natural element is taken as the average mass of all the naturally occurring atoms of that element. If an element has no isotopes, then the mass of its atom would be the same as the sum of protons and neutrons in it. But if an element occurs in isotopic forms, then we have to know the percentage of each isotopic form and then the average mass is calculated.

Chemical properties of all the isotopes of an element are the same. Some isotopes have special properties which find them useful in various fields. Such as, an isotope of uranium is used as a fuel in nuclear reactors, isotope of cobalt is used in the treatment of cancer, iodine is used in the treatment of goitre.

(i) The atoms of the same element, having the same atomic number but different mass numbers are termed as _____

(a) Isotopes
(b) Isobars
(c) Isotones
(d) None of the above

(ii)Which of the following are the isotopes of the hydrogen atom.

(a) Protium (b) Deuterium (c) Tritium (d) All of the above

(iii) Give any two uses of isotopes.

OR

(iii) Define isotopes with any one suitable example.

28 5

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

(i) Sodium oxide (Na=23, O=16)

(ii) Calcium sulphate (Ca=40, S=32, O=16)

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

(i) Chlorine

(ii) Sulphur

OR

(a) Write down the names of compounds represented by the following formula**e:**

(i) Al_2S_3 (ii) CaO (iii) KNO_3 (iv) Na_3P

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

(i) Slaked lime

(ii) Potassium sulphate

(iii) Baking soda

Section-C (Physics)

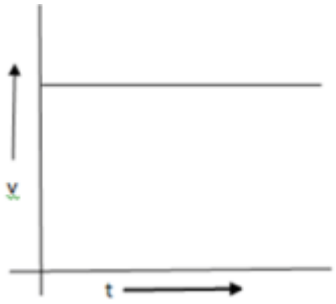
29 **From the given v-t graph, it can be inferred that the object is** 1

(a) At rest

(b) In uniform motion

(c) Moving with uniform acceleration

(d) In non-uniform motion



30 A student carries a bag weighing 5 kg from the ground floor to his class on the first floor that is 2 m high. The work done by the boy is 1

(a) 1 J (b) 10 J (c) 100 J (d) 1000 J

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.

31 **Assertion:** A karate player breaks a slab of ice with a single blow. 1
Reason: The player applies a large force in a very short interval of time.

32 A bike can accelerate from rest to 28 m/s in only 4 s. 2

(a) What is average acceleration?

(b) What distance does it travel in that time?

OR

A car starts from rest and moves with a uniform acceleration of 0.1 m/s 2 for 2 minutes. Find:

(a) The speed acquired

(b) The distance travelled

33 Why is it difficult to hold a school bag with a strap made of a thin and strong string? 2

34 What is the loudness of sound? What factors does it depend on? 2

35 A bus travels at a speed of 90 km/h. Brakes are applied to produce a uniform acceleration of -0.5 m/s 2. Please find out how far the train will go before it comes to rest. 3

36 An astronaut has a mass of 80 kg on Earth. 3

i) What is its weight on Earth?

ii) What will be its mass and weight on Mars with gm=3.7ms-2?

37 (a) Define pressure. State its SI unit. 3

(b) The dimensions of a metallic cuboid are 30 cm × 20cm × 15 cm, and its mass is 30 kg. If the acceleration due to gravity is 10 m/s 2, calculate the pressure exerted by the cuboid when it rests on the face with sides 20 cm × 15 cm on the table.

(c) In which of the following situations do we exert more pressure on the ground? Whether standing on one foot or standing on both feet? Justify the answer.

38 4

Case Study: A car of mass **1000 kg** is moving with a velocity of **20 m/s** on a straight road.
Questions:

(i) Define kinetic energy.
(ii) Calculate the kinetic energy of the car.
(iii) If the speed of the car is doubled, how will its kinetic energy change?
(iv) Write the SI unit of kinetic energy.

39 (a) What is sound, and how is it generated? 5

(b) An echo can be heard after 3 s. What is the distance from the reflecting surface to the source at a sound speed of 342 ms^{-1}?

Or

(a) Define frequency, time period and amplitude of a sound wave. State their SI units and effect on sound.
(b) Explain the characteristics of sound: loudness, pitch and quality.

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