Name: Vaishnavi Goel
Class: IX - D
Subject: Science (086)
Date: 15.9.2025
Invigilator's Sign:
Time allowed: 3 hours
Maximum Marks: 80

MAXFORT

SET-A
SUBJECT CODE: 086

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

Q.1) A virus disables the ribosomes in a cell. Which of the following cellular activities will stop first? (1)

A. Energy release B. Protein synthesis C. Waste removal D. Water absorption

Q.2) A poultry farmer notices reduced egg production in hens. On consulting a veterinarian, it was found that the birds were not getting adequate minerals and vitamins. This problem can be solved by: (1)

A. Supplementing their diet with micronutrients.
B. Improving their housing conditions.
C. Using deep tube well water for obtaining drinkable water.
D. Shifting to a cage-free system.

Q.3) Which of the following would most likely occur if a cell's lysosomes burst? (1)

A. Decreased ATP synthesis
B. Stabilized pH
C. Uncontrolled digestion of cell components
D. Enhanced protein packaging

Q.4) A river passes near a farmer's land, but he has no permanent irrigation source. Which method is best for him to directly draw water from the river for crops? (1)

A. Open wells B. Canal system C. River lift system D. Drip irrigation

Q.5) Which structure regulates the movement of molecules in and out of the cell? (1)

A. Nucleus B. Cytoplasm C. Mitochondria D. Plasma membrane

Q.6) A fish farmer wants to rear both catla (surface feeder) and rohu (middle-zone feeder) in the same pond to increase yield. Which type of fish culture should he adopt? (1)

A. Composite fish culture
B. Marine fish culture
C. Inland fish culture
D. Ornamental fish farming

Q.7) A grocer sprays water on vegetables in the market to keep them fresh. Which statement best explains this? (1)

A. Vegetables undergo plasmolysis and lose water.
B. Vegetables absorb water by endosmosis and remain turgid.
C. Vegetables carry out photosynthesis after absorbing water.
D. Vegetables take in water by active transport.

The following two questions consist 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.

Q.8) **Assertion (A):** The cell wall provides structural support to plant cells. (1)
Reason (R): It is a rigid layer made primarily of cellulose.

Q.9) **Assertion (A):** Crop rotation helps in improving soil fertility. (1)
Reason (R): It involves growing only cereals year after year in the same field.

Q.10) Describe any two methods of irrigation that can be used to supply water in the fields and increase crop production. (2)

Q.11) Analyze the structure-function relationship in mitochondria. How does its structure support its function? Give reason for your answer. (2)

Q.12) *Attempt either option A or B.* (2)

A. A poultry farm owner observes a sudden spread of disease among the birds. Which two preventive measures could have reduced the risk?

OR

B. A dairy farmer observes that milk yield in his cows is dropping. Suggest two measures related to cattle management that could help improve yield.

Q.13) In a rare condition, scientists noticed that cells in a patient's body were unable to regulate their daily activities. They could not produce the right proteins or lipids and cell division was irregular. Some cells even began accumulating harmful substances due to the absence of proper command signals. The overall control of the cell seems to have collapsed.

A. Which cell organelle plays a central role in cellular reproduction? Briefly explain its structure. (2)
B. Identify the cell organelle responsible for each of the following conditions observed in the case: (1)
(i) Packaging and dispatching of proteins
(ii) Synthesis of lipids

Q.14) A sugarcane farmer is facing reduced yields due to frequent pest attacks and low soil fertility. Suggest any three methods that he can use to improve his crop yield. (3)

Q.15) A farmer owns 5 hectares of land in an area with moderate rainfall. He wants to grow food crops and also start poultry farming. His aim is to ensure year-round income while maintaining soil health.

A. Suggest a combination of crops suitable for year-round cultivation. (1)
B. Give one method to control disease spread in poultry. (1)

Attempt either option C or D

C. Explain how mixed farming can help in risk management. (2)

OR

D. Describe how intercropping can be useful for maintaining soil health.

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

A. Red blood cells placed in pure water burst, while those placed in concentrated saline solution shrink. However, in a 0.9% NaCl solution, they remain unchanged.

(i) Explain why RBCs burst in pure water. Why do plant cells not burst when placed in pure water? (2)
(ii) Define the process responsible for bursting and shrinking of RBCs. Why do RBCs remain unchanged in 0.9% NaCl solution? Explain your answer. (3)

OR

B. Ritika, a Class 9 student, read in her science book that certain cell organelles can produce some of their own proteins because they have their own DNA and ribosomes. She decided to research more and found that these organelles are believed to have evolved from free-living prokaryotic cells that began living inside larger cells.

(i) Name the organelles that have their own DNA and ribosomes. Write one similarity and one difference between these two organelles. (3)
(ii) How are eukaryotic cells different from prokaryotic cells? State any two differences. (2)

SECTION- B

Q.17) A liquid medicine bottle shows "Shake well before use" on the outer label. The medicine is most likely a: (1)

A. Colloid B. Suspension C. Solution D. Compound

Q.18) Which of the following set of properties is possessed by liquids? (1)

A. Definite shape and definite volume B. Fluidity and definite shape
C. Rigidity and definite volume D. Fluidity and definite volume

Q.19) A solution that contains the maximum amount of solute at a given temperature is called: (1)

A. Unsaturated B. Dilute C. Saturated D. Supersaturated

Q.20) Which of the following substance exhibit the strongest intermolecular forces? (1)

A. Water B. CO_2 C. Alcohol D. Sugar

Q.21) Which separation technique is used to separate a mixture of salt and camphor? (1)

A. Filtration B. Sublimation C. Crystallization D. Distillation

Q.22) Seema took a 100 ml beaker and filled half the beaker with water and marked the level of water. She dissolved some salt with the help of a glass rod and recorded water level again. Choose the correct observation related to above activity. (1)

A. The water level increases rapidly. B. The water level decreases.
C. The water level remains the same. D. There is little increase in water level.

Q.23) Which of the following best demonstrates particles of matter are always in motion? (1)

A. Spreading of perfume B. Melting of wax C. Rusting of iron D. Freezing of water

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Q.24) **Assertion (A):** Natural gas is transported by storing in cylinders. (1)
Reason (R): Gases do not have a fixed shape and volume.

Q.25) A blacksmith chooses iron to make tools, while a jeweller uses gold for making ornaments. (2)
(i) Which property of metals make them suitable for these uses?
(ii) State any one property of metals that is generally not found in non-metals.

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

A. 1 kg block of ice at 0°C is converted into water at 0°C. (1)
(i) Why does the temperature remain unchanged during this process? (2)
(ii) Name and define the physical property responsible for the constant temperature.

OR

B. When Ravi's grandmother had a high fever, the doctor advised placing strips of wet cloth on her forehead to help bring down her temperature. A few days later, while offering prayers, Ravi observed that the camphor in an open dish had reduced in size and eventually disappeared. (1)
(i) How does the use of wet cloth strips help lower the body temperature during fever? (2)
(ii) What is the process responsible for the disappearance of camphor in open air? Describe it.

Q.27) A student prepared a solution by dissolving 40 g of salt in 200 g of water. (1)
(i) What type of solution is formed—homogeneous or heterogeneous? Give reason for your answer. (2)
(ii) Calculate the concentration of this solution in terms of mass-by-mass percentage.

Q.28) Sara accidentally left an ice-filled glass on the kitchen counter. After some time, she observed:

- The ice cubes had reduced in size.
- Water droplets had formed on the outside of the glass.
- The water inside was still cold.

A. Which change of state caused the reduction in the size of the ice cubes? (1)

a) Solid → Liquid b) Liquid → Gas c) Solid → Gas d) Liquid → Solid

Attempt either option B or C

B. If the same experiment was conducted in an air-conditioned room, how would the droplet formation rate change? Justify your answer. (1)

OR

C. If the surrounding air had 0% humidity, what would be observed on the outside of the glass? Give reason for your answer.

D. Why did the water inside the glass remain cold even after some of the ice had melted? (2)

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

A. During an experiment, a science teacher gives her students three beakers:

- Beaker A: Milk mixed in water
- Beaker B: Sugar dissolved in water
- Beaker C: Soil mixed with water

She switches off the lights and passes a beam of light through each beaker to observe the Tyndall effect.

(i) Which beaker/s will show the Tyndall effect and why? (1)

(ii) Identify the beaker containing the mixture that can be separated using filter paper. (1)

(iii) Identify the type of mixture in each beaker and give reason for your answer. (3)

OR

B. In a school lab, students observe the following characteristics of three unknown elements:

Sample	Appearance	Conducts Electricity	Malleable
A	Shiny, grey	Yes	Yes
B	Dull, brittle	No	No
C	Shiny, brittle	Poor conductor	No

(i) Which sample shows properties of both metals and non-metals? Also, name an element which shows properties of both metals and non-metals. (1)

(ii) Name any two elements which are liquid at room temperature. (1)

(iii) Classify sample A and B as metal, non-metal, or metalloid. Give reason for your answer. (3)

SECTION- C

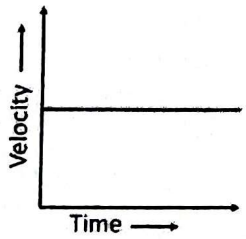
Q.30) Which of the following increases the inertia of an object? (1)

A. Increasing its velocity B. Increasing its mass

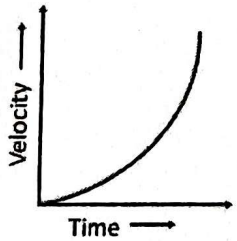
C. Changing its shape D. Increasing surface area

Q.31) A vehicle is moving with a uniform velocity. Which of the following graphs will represent its motion? (1)

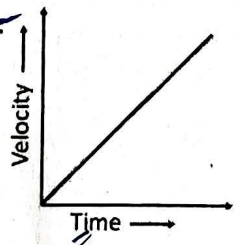
A.



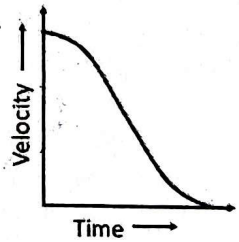
B.



C.



D.



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Q.32) **Assertion (A):** When a car suddenly starts, the passengers tend to fall backward. (1)

Reason (R): The inertia of motion keeps the lower part of the body at rest while the upper part moves backward.

Q.33) Give reasons for the following: (2)

(i) During a game, a player pushes the ground backward with his foot and moves forward.
(ii) It is harder to stop a moving truck than a moving bicycle.

Q.34) *Attempt either option A or B.* (2)

A. One round of a circular track of radius 50 m is completed by a runner in 40 seconds. Find:
(i) the distance covered
(ii) the displacement at the end of one round

OR

B. A truck starts from rest and accelerates uniformly at 1.5 m/s² for 10 seconds. Calculate the distance covered in this time.

Q.35) Explain any two differences between balanced and unbalanced forces with one real-life example of each. (3)

Q.36) A trolley is pushed with different forces and the following accelerations are observed: (3)

Force (N)	Acceleration (m/s²)
2	0.5
4	1.0
6	1.5

(i) What is the relationship between force and acceleration?
(ii) What will happen to acceleration if the mass of the trolley is doubled while force remains the same?
(iii) Define the law which governs this relationship.

Q.37) Compare and write any two differences between uniform motion and non- uniform motion along with one example of each. (3)

Q.38) The following table shows time and distance covered by a cyclist: (4)

Time (s)	Distance (m)
0	0
2	4
4	16
6	36

A. Calculate the speed of the cyclist between 2 s and 4 s.
B. Does the cyclist have uniform acceleration? Justify your answer.
Attempt either option C or D
C. Sketch a distance-time graph based on the given data.

OR

D. Calculate the acceleration of the cyclist between 0 s and 6 s.

Q.39) *Attempt either option A or B.*

A. A bus of mass 5000 kg is moving at 15 m/s. The driver suddenly applies brakes to avoid hitting an obstacle, and the bus stops in 4 seconds.
(i) Calculate the retardation. (2)
(ii) Find the force applied by the brakes. (2)
(iii) How does the use of seat belts help in this situation? Which law of motion will be applicable in this case. (1)

OR

B. A footballer kicks a ball of mass 0.4 kg initially at rest. The ball moves with a velocity of 12 m/s after the kick. The foot is in contact with the ball for 0.05 seconds.
(i) Calculate the change in momentum. (2)
(ii) Find the force exerted by the player's foot. (2)
(iii) State the law of motion this case is based on. (1)