KOTHARI INTERNATIONAL SCHOOL, NOIDA
ANNUAL EXAMINATION, SESSION: 2024-25
GRADE: 9 SUBJECT: SCIENCE (086)
SET B

DAY & DATE: MONDAY, 17th FEBRUARY' 25
MAXIMUM MARKS: 80 **TIME ALLOTTED: 3 HRS**
NAME: _____ **ROLL NO:_ _____**

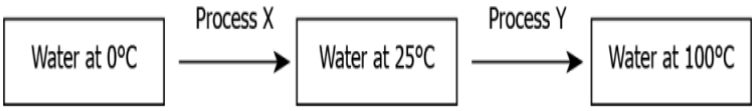
GENERAL INSTRUCTIONS:

i. This question paper consists of 39 questions in 5 sections.
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.
iii. Section A consists of 20 objective type questions carrying 1 mark each.
iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION – A

Select and write the most appropriate option out of the four options given for each of the questions 1 – 20

1. The image shows two changes. **(1)**



Identify Process X and Y.
(a) Process X – freezing; Process Y – melting
(b) Process X – melting; Process Y – evaporation
(c) Process X – condensation; Process Y – melting
(d) Process X – evaporation; Process Y – condensation

2. A student listed some mixtures and classified them into various types **(1)**

Mixture	Components	Type of Mixture
W	Food colour + Water	Homogeneous solution
X	Sand + water	Colloidal solution
Y	Milk + sugar	Suspension
Z	Rice + Flour	Heterogeneous mixture

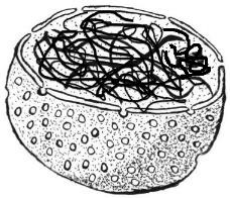
Which mixtures are classified correctly?
(a) W and X (b) X and Y (c) Y and Z (d) W and Z

3. Match the following: **(1)**

Column I	Column II
A. Endoplasmic Reticulum (ER)	p. packaging of materials in a cells
B. Chloroplast	q. sites of protein manufacture
C. Golgi body	r. digestion of worn out cells
D. Lysosomes	s. organelle of photosynthesis

(a) A-q, B-s , C- p, D- r (b) A-s, B-r , C-q, D-p
(c) A-q , B- r ,C- s, D-p (d) A-p, B-r, C-q , D-s

4. The given figure shows a certain cell organelle. Which of the following cells lacks this organelle: **(1)**



(a) Human RBCs (b) Muscle cells (c) Liver cells (d) Bone cells

5. The percentage of copper and oxygen in samples of CuO obtained by different methods were found to be the same. The illustrate the law of **(1)**
(a) Constant proportion (b) Conservation of mass
(c) Multiple proportions (d) Reciprocal proportions

6. Which of the following is **NOT** the correct explanation of Thomson's atomic model? **(1)**
(a) The atom is positively charged sphere
(b) Electrons are embedded in the positive sphere
(c) The positive and negative charges balance each other
(d) Protons and neutrons are embedded in the center of the sphere

7. Tincture of iodine has antiseptic properties. This solution is made by dissolving **(1)**
(a) iodine in potassium iodide (b) iodine in vaseline
(c) iodine in water (d) iodine in alcohol

8. The acceleration due to gravity at three point A, B and C above the surface of the earth are 9.8 m/s^2, 10m/s^2 and 5 m/s^2 respectively. Which of the following is **INCORRECT**? **(1)**
(a) B is at least distance out of three point from the centre of the earth
(b) C is at farthest distance out of three point from the centre of the earth
(c) Weight of the object is lowest at point C out of three point
(d) The weight of the object varies as $W_A > W_B > W_C$

9. Select the correct statements **(1)**
(i) Hybridization means crossing between genetically dissimilar plants
(ii) Cross between two varieties is called as inter specific hybridization
(iii) Introducing the genes of desired characters into a plant gives genetically modified crop
(iv) Cross between plants of two species is called as inter varietal hybridization
(a) (i) and (iii) (b) (ii) and (iv)
(c) (ii) and (iii) (d) (iii) and (iv)

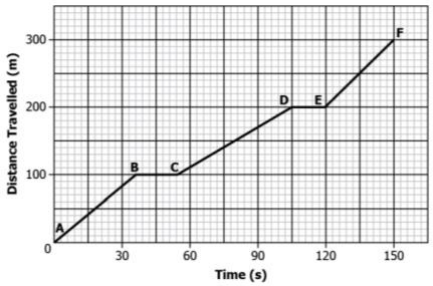
10. A particle covers equal distances in equal intervals of time in the same direction. It is said to be **(1)**

(a) Moving with constant speed (b) Moving with constant acceleration
(c) Moving with variable acceleration (d) At rest

11. Broilers are maintained for getting :- **(1)**

(a) Milk (b) Egg (c) Meat (d) Leather

12. The graph shows the distance travelled by a car and the time taken by the car. **(1)**



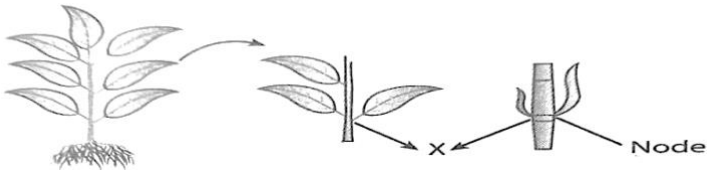
Between which points the car travels the fastest?

(a) A to B (b) B to C (c) C to D (d) E to F

13. Which of the following statements about solutions is true? **(1)**

(a) Solutions are always homogeneous mixtures
(b) Solutions can be separated into their components by filtration
(c) The solute is present in larger quantity than the solvent in a solution
(d) Solutions cannot be formed with gases

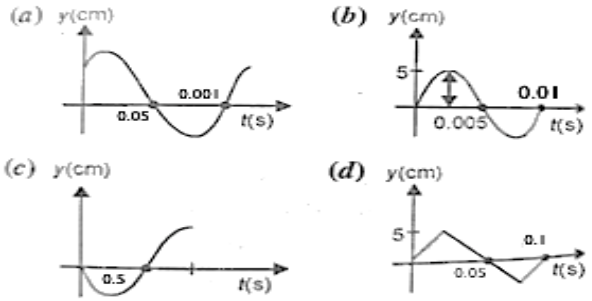
14. The image shows the stem of a plant. **(1)**



Which type of meristematic tissue is present at the labelled part 'X'?

(a) Lateral meristem (b) intercalary meristem
(c) apical meristem (d) both apical and lateral meristem

15. The wave having an amplitude of 5 cm and frequency f = 100 hertz can be best represented by which of the following graphs **(1)**



16. The maximum speed of vibrations which produce audible sound will be in: **(1)**

(a) Sea water (b) Ground glass (c) Human blood (d) Dry air

The following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions 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.

17. **Assertion (A):** No work is done with respect to gravity when a woman carrying a load on her head, walks on a level road with a uniform velocity. **(1)**
Reason (R): No work is done if force is perpendicular to the direction of displacement

18. **Assertion (A):** The cell wall in plants is non-living and freely permeable. **(1)**
Reason (R): Cell wall in plants provide mechanical strength.

19. **Assertion (A):** A bicycle has to be pedalled again and again to keep it moving with a uniform velocity. **(1)**
Reason (R): Force is applied on the bicycle to balance the force of friction exerted by the ground on the bicycle.

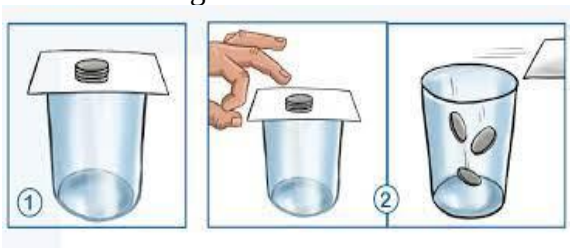
20. **Assertion (A):** The inner lining of intestine has tall epithelial cells. **(1)**
Reason (R): Columnar epithelium facilitates absorption and secretion.

SECTION – B
(Question No. 21 to 26 are very short answer questions)

21. (a) State one difference between gas and vapour. **(2)**
(b) Convert the boiling point of water into Kelvin temperature.

22. What is the difference between chromatin and chromosomes? (2 points) **(2)**

23. In the figure given below, the card is flicked with a push. It was observed that the card moves ahead while coin falls in glass. **(2)**



(a) Give reason for the above observation.
(b) Why is the recoil of a heavy gun, on firing, not so strong as that of a light gun using the same cartridge?

24. A solution of 3% glucose and a solution of 8% glucose are kept in a trough separated by a semipermeable membrane. What will you observe after 1 hour? Explain giving reason. **(2)**

25. (a) Name the following: **(2)**
(i) Tissues that connect bone to bones
(ii) Tissues that transport water in plants.

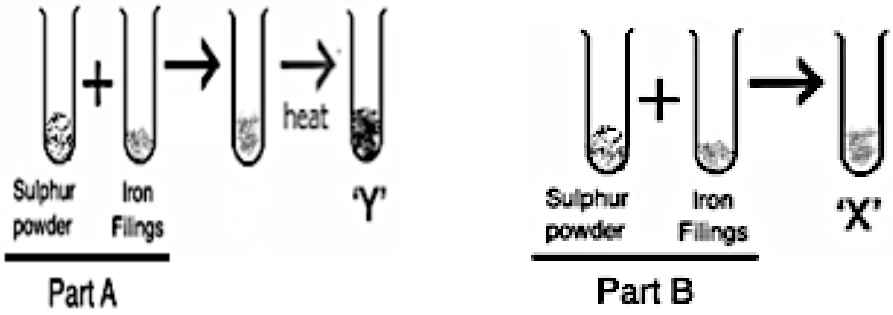
(b) List the role of cork in plants

26. (a) When 3.0 g of magnesium is burnt in 2.00 g of oxygen, 5.00 g of magnesium oxide is produced. What mass of magnesium oxide will be formed when 3.00 g magnesium is burnt in 5.00 g of oxygen ? Which law of chemical combination will govern your answer? **(2)**

(b) Why do noble gases have zero valency? Explain giving one example.

SECTION – C
(Question No. 27 to 33 are short answer questions)

27. Iron filings and Sulphur were mixed together and divided into two parts 'A' and 'B'. Part 'A' was heated strongly while Part 'B' was not heated. Observe the figure and answer the following questions: **(3)**

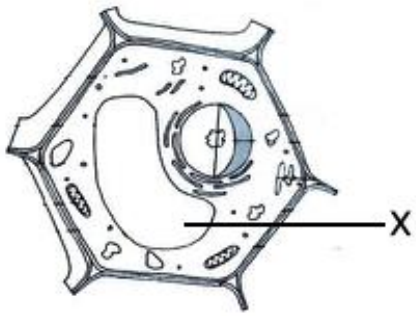


(a) What will be formed in 'Y' and 'X'?
(b) A bar magnet was brought close to both 'Y' and 'X'. Explain their behaviour towards magnet.
(c) Differentiate between a mixture and a compound.

28. (a) Write the chemical formulae for the following compounds using criss cross method: **(3)**
(i) Magnesium oxide
(ii) Sodium nitrate

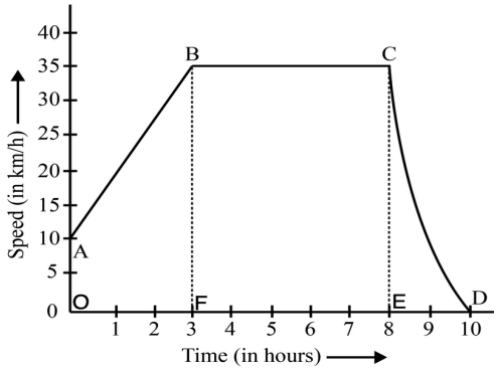
(b) An element forms a chloride ACl_3. What is the formula of the oxide of A? What is the valency of A?

29. The diagram shows a plant cell with some of its organelles. X is also a cell organelle. **(3)**



(a) What does X represent in the diagram?
(b) Write the function of X.
(c) The inner membrane of the mitochondria is folded into many finger-like projections. Explain what would happen if the inner membrane was not folded?
(d) Which two features in the above cell make it different from an animal cell apart from 'X'?

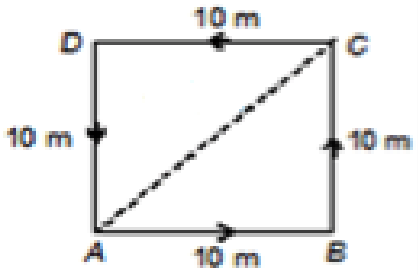
30. The graph given shows how the speed of a car changes with time : **(3)**



(a) What is the initial speed of the car?
(b) What is the maximum speed attained by the car?
(c) Which part of the graph shows zero acceleration?
(d) Which part of the graph shows varying retardation?
(e) Find the distance travelled in first 8 hours.

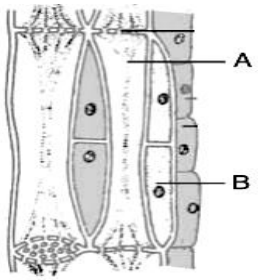
OR

An electron moving with a velocity of 5×10^4 m/s enters into a uniform electric field and acquires a uniform acceleration of 10^4 m/s^2 in the direction of its initial motion.
(a) Calculate the time in which electron would acquire a velocity double of its initial velocity.
(b) How much distance the electron would cover in this time?
(c) Observe following diagram. Find the distance and displacement when particle moves from point A to C through A-B-C?



31. (a) Define I Newton force. **(3)**
(b) An object of mass 100 kg is accelerated uniformly from a velocity of 5 m/s to 8 m/s in 6 sec. Calculate the initial and final momentum of the object. Also find the magnitude of force exerted on the object.

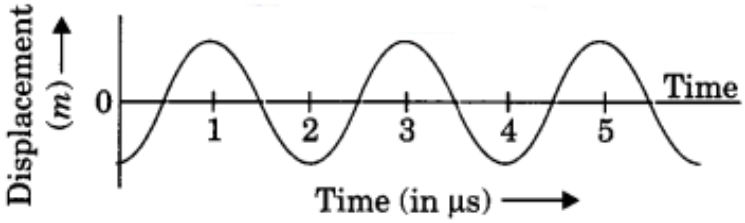
32. Observe the given plant tissue and answer the following questions: **(3)**



(a) Identify the plant tissue shown in the diagram. What is its function?
(b) Label the parts marked 'A' and 'B'.

33. (a) Represent graphically by two separate diagrams: Two sound waves having the same frequency but different amplitudes. **(3)**

(b) The given graph (Fig.) shows the displacement versus time relation for a disturbance travelling with velocity 1500 ms^{-1}. Calculate the wavelength of the disturbance.



SECTION – D
(Question No. 34 to 36 are long answer questions)

34. (a) Complete the given table for the elements $^{16}_{8}X$ and $^{23}_{11}Y$ **(5)**

Element	Number of neutrons	Valency
X		
Y		

(b) An element has 4 valence electrons in its M shell.
(i) Identify the element and write its electronic configuration.
(ii) Draw its structure according to Bohr Model.

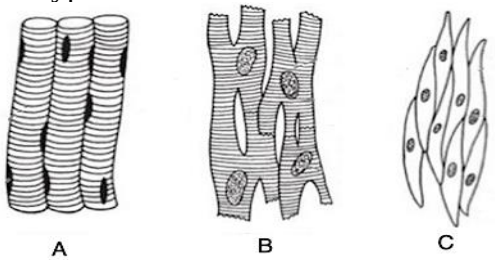
OR

(a) From Rutherford's alpha particle scattering experiment, give the experimental evidence for deriving the conclusion that most of the space inside the atom is empty.

(b) What is the difference between isotope and isobar? Name the element whose isotope is used:
(i) as a fuel in nuclear reactor
(ii) in the treatment of goitre.

(c) If chlorine atom is available in the form of two isotopes, $_{17}Cl^{35}$ (75%) and $_{17}Cl^{37}$ (25%), Calculate the average atomic mass of chlorine atom.

35. The picture shows three types of muscular tissue in human body: **(5)**



(a) Identify 'A', 'B' and 'C'. Where are tissue 'A', 'B' and 'C' most likely to be found in human body?
(b) State two points of difference between tissue 'A' and 'B'.

OR

Give reason:

(a) Intercellular spaces are absent in sclerenchyma tissue.
(b) Epidermal tissue cells are tightly packed.
(c) Branches of a tree move and bend freely in high wind velocity.
(d) Ciliated columnar epithelium is present in the respiratory tract.
(e) People in old age often suffer from joint pain.

36. (a) What is meant by free fall? **(5)**

(b) On what factors does the gravitational force between two bodies depend? How does the gravitational force between two bodies change if the distance between them is tripled?

(c) A man weighs 600 N on earth. What is his mass? ($g = 10\ m/s^2$). On moon his weight would be 100 N. What is the acceleration due to gravity on moon?

OR

(a) A body is weighed first in air, then in liquid A and then in liquid B. The observations are 100N, 50 N and 60 N respectively. Which liquid is denser? Justify.

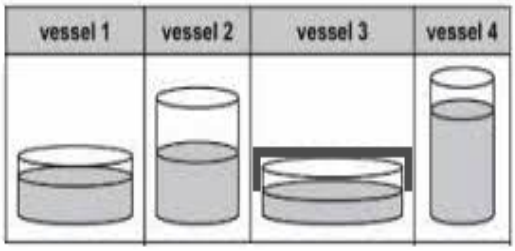
(b) The volume of 100 g of a solid substance is 25 cm^3 and the density of water is $1g/cm^3$. Find the density of the substance. Will it float or sink in water?

(c) Distinguish between mass and weight of an object. (2 points)

SECTION – E

(Question No. 37 to 39 are case-based/ data-based questions with 3-4 short sub parts. Internal choice is provided in one of these parts)

37. Madhu poured 100 mL of water to each of four different glass vessels. She kept all the four vessels under the Sun. Vessel 3 is covered and vessel 1 and 4 are placed under fan. **(4)**



(a) In how many beakers, water will escape into atmosphere as vapours? Name them.

(b) Name the process X of escaping of water from liquid to vapour state below its boiling point. What is the reverse process known as?

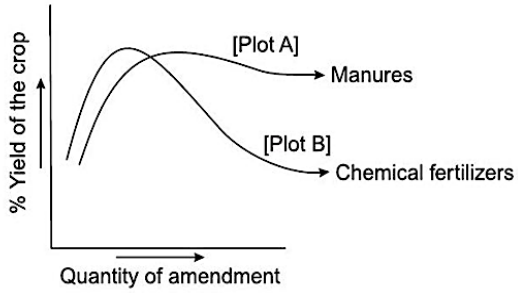
(c) After one hour from the beginning of the experiment, the water level will fall to the maximum in which beaker? Give reason.

(d) How will the process get affected if the above activity is carried out on a rainy day. Justify your answer.

OR

(d) What will be the difference in the above process if acetone is taken in the same beakers in place of water. Explain.

38. The figure given below shows two crop fields (plot A and plot B) that have been treated by manures and chemical fertilizers respectively, keeping other environmental factors same. Answer the questions that follow: **(4)**

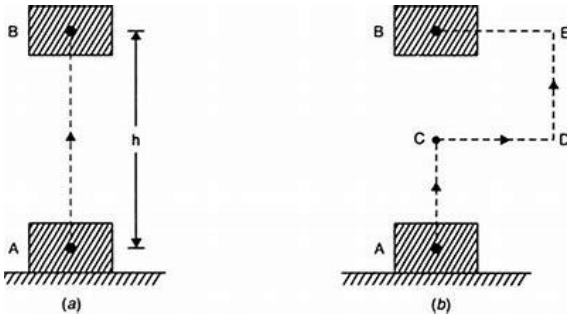


Read the given passage carefully and give the answer of the following questions:
(a) Why does plot B show sudden increase and then gradual decrease in yield?
(b) Why is the highest peak in plot A graph slightly delayed?
(c) Compare manure and fertilizers with respect to their nutrient content and effect on soil.

OR

(c) How is the use of manure particularly useful for sandy and clayey soils?

39. A block of mass 'm' raised from position A to B by taking two different paths as shown in figure (a) and (b). Let the height AB be 'h'. **(4)**



(a) How much is the work done on the block in figure (a) and (b)? Give reason.

(b) Find the potential energy possessed by an object of mass 6 kg when it is raised to a height of 15 m above the ground. (given g = 9.8 m/s^2)

(c) Certain force acting on a 10 kg mass changes its velocity from 8m/s to 2m/s. Calculate the work done by the force.

OR

(c) An object of mass 'm' moving with a uniform initial velocity 'u' was displaced through a distance 's' when a force 'F' was applied on the object. Final velocity changed to 'v'. Derive the mathematical expression for the kinetic energy of the object.