

**KOTHARI INTERNATIONAL SCHOOL, NOIDA**  
**ANNUAL EXAMINATION, SESSION: 2023-24**  
**GRADE: 9 SUBJECT: SCIENCE (086)**  
**SET A**

**DAY & DATE: 9<sup>th</sup> FEBRUARY' 24, FRIDAY**

**MAXIMUM MARKS: 80**

**NAME: \_\_\_\_\_**

**TIME ALLOTTED: 3 HRS**

**ROLL NO: \_\_\_\_\_**

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**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. Under which of the given conditions evaporation is expected to be the fastest? (1)

	RELATIVE HUMIDITY	TEMPERATURE
(a)	28%	50°C
(b)	18%	60°C
(c)	30%	40°C
(d)	82%	30°C

2. An example of liquid metal and liquid non-metal is: (1)

- |                      |                       |
|----------------------|-----------------------|
| (a) Gallium, mercury | (b) Mercury, chlorine |
| (c) Mercury, bromine | (d) Bromine, sulphur  |

3. In a certain reaction 24 g of magnesium reacts completely with 16 g of oxygen to give 40 g of magnesium oxide. How much magnesium oxide will be produced if 48 g of magnesium reacts completely with oxygen? (1)

- (a) 32 g                      (b) 40 g                      (c) 80 g                      (d) Cannot be decided

4. If  $Z=6$ , what would be the valency of the element: (1)

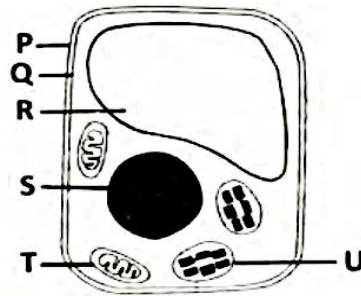
- (a) 6                      (b) 4                      (c) 2                      (d) 8

5. What property of an element determines its chemical behaviour? (1)

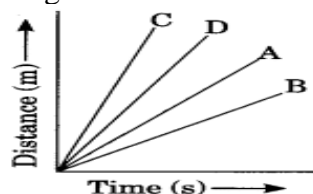
- |                                |                                      |
|--------------------------------|--------------------------------------|
| (a) Size of an element         | (b) Valency of an element            |
| (c) Atomic mass of the element | (d) Number of nucleons in an element |

6. If the forces of attraction between the particles of a substance are very strong then it will have: (1)
- (a) high rate of diffusion (b) high melting point  
(c) low density (d) low boiling point

7. Which labelled organelles helped a student to conclude that it is a plant cell? (1)

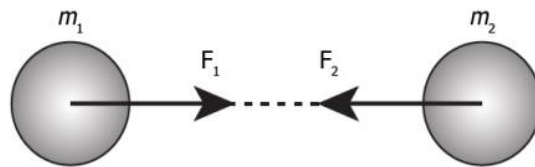


- (a) P and R only (b) P and S only (c) P, R and T only (d) P, R and U only
8. Anil has bacterial infection. Which part of the cell will help him eliminate bacteria from his body and how? (1)
- (a) Vacuoles as they can uptake any material and store it  
(b) Lysosomes as they can destroy their own cell  
(c) Lysosomes as they have digestive enzymes to breakdown foreign material  
(d) Vacuoles as they can expel substance out of the cell
9. In desert plants, rate of water loss gets reduced due to the presence of (1)
- (a) cuticle (b) stomata (c) lignin (d) suberin
10. The process of growing two or more crops simultaneously in a definite pattern: (1)
- (a) Crop rotation (b) Inter-cropping  
(c) Mixed cropping (d) Organic cropping
11. Aseel is an Indian breed of: (1)
- (a) Cattle (b) Marine fish (c) Poultry (d) Honey bee
12. In which of the following cases of motions, the distance moved and the magnitude of the displacement is equal? (1)
- i. If the car is moving on a straight road  
ii. If the car is moving in a circular path  
iii. The pendulum is moving to and fro  
iv. The earth is moving around the sun
- (a) only(ii) (b) (i) and (iii) (c) (ii) and (iv) (d) only (i)
13. Four cars A, B, C, and D are moving on a levelled road. Their distance versus time graphs is shown in the adjacent figure. Choose the correct statement. (1)



- (a) Car A is faster than car D (b) Car B is the slowest  
(c) Car D is faster than car C (d) Car C is the slowest

14. The image shows a model of Earth with mass  $m_1$  and its moon with mass  $m_2$ . (1)



Based on the model, what should be the magnitude of forces  $F_1$  and  $F_2$  in accordance with the Newton's third law of motion?

- (a)  $F_1 = F_2$  (b)  $F_1 > F_2$  (c)  $F_1 < F_2$  (d)  $F_1 = -F_2$
15. Sound can travel through: (1)
- (a) gases only  
(b) vacuum only  
(c) gases and liquids only  
(d) solids, liquids and gases
16. When we change feeble sound to loud sound we increase its: (1)
- (a) frequency (b) amplitude (c) velocity (d) wavelength

**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.

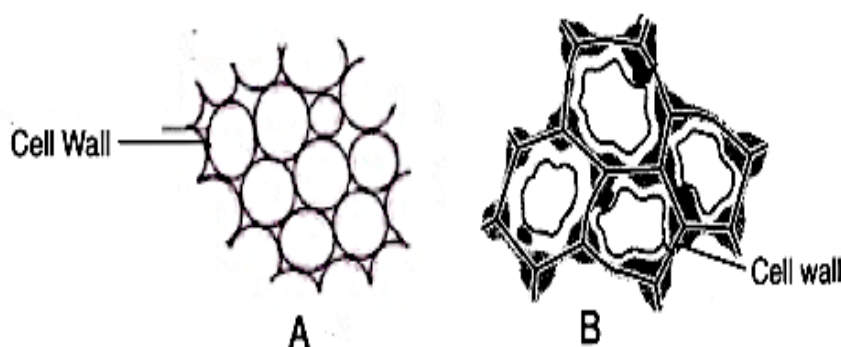
17. **Assertion (A):** When various forces are acting on a body at rest, then the body may accelerate or remain at rest. (1)  
**Reason (R):** Acceleration on a body is produced only due to resultant force acting on it.
18. **Assertion (A):** A stone thrown vertically upwards possesses only kinetic energy at its highest point. (1)  
**Reason (R):** Sum of kinetic energy and potential energy of the object is constant at any point of its travel.
19. **Assertion (A):** The movement of alimentary canal, iris of eye and bronchi of lungs are not under our control. (1)  
**Reason (R):** These movements are controlled by striated muscles.
20. **Assertion (A):** Plasma membrane is selectively permeable. (1)  
**Reason (R):** Plasma membrane allows some molecules to pass through it while restricting others.

## SECTION – B

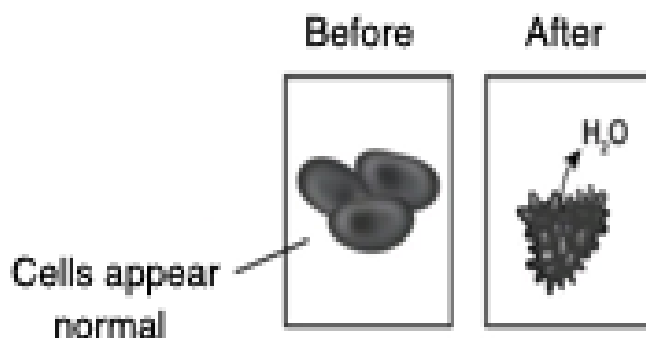
(Question No. 21 to 26 are very short answer questions)

21. Give reasons for the following: (2)
- (a) During summer, sitting under a fan makes us comfortable.  
(b) When salt dissolves in water, the level of water does not rise appreciably.
22. (a) How does Amoeba obtain its food? Also name the process. (2)  
(b) How do substances like carbon dioxide and water move in and out of the cell?

23. (a) Identify and name the tissues 'A' and 'B' in the following diagram. (2)  
 (b) State one difference between the tissues 'A' and 'B'.



24. (a) What is the number of electrons in Mg atom and  $Mg^{2+}$  ion ? (2)  
 (b) Draw the atomic structure of Mg atom and  $Mg^{2+}$  ion
25. The following diagram shows RBCs placed in a solution. (2)  
 Identify the type of solution (hypertonic, hypotonic or isotonic) in which the cells were placed and define the process which has caused the change.



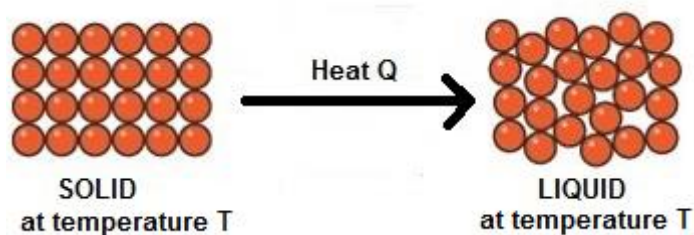
26. Two balls A and B of masses 'm' and '2m' are in motion with velocities '2v' and 'v' respectively. Compare: (2)  
 (a) their inertia  
 (b) their momentum

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

27. (a) Name the organelles which help in: (3)  
 i. energy production  
 ii. modification, packaging and dispatching of substances  
 iii. lipid synthesis  
 (b) Draw a neat diagram of an animal cell and label the above organelles in the diagram.
28. Complete the following table (Show working for calculation of molecular mass) (3)

Compound	Chemical formula	Molecular mass
(a) Magnesium Sulphate		
(b) Ammonium Chloride		

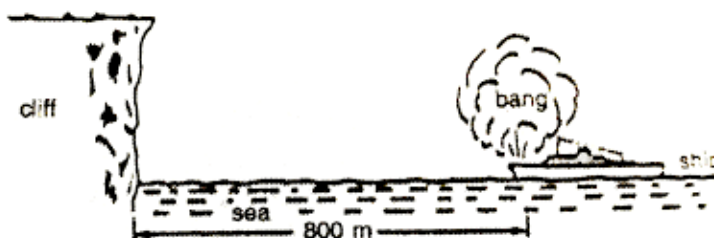
29. A substance undergoes a physical change from solid to liquid state. It absorbs  $Q$  amount of heat at constant temperature  $T$ . (3)



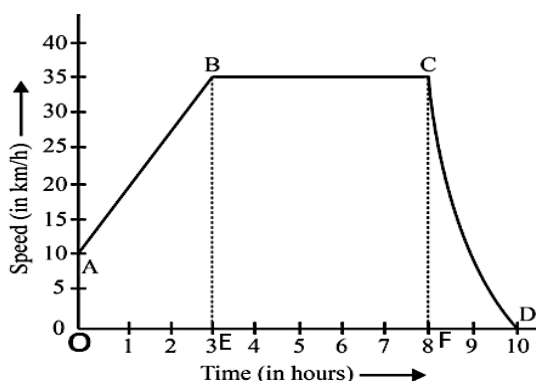
- Identify this heat  $Q$  and define it.
  - Why does the temperature remain constant during this change?
  - State the temperature  $T$  (in Kelvin) at which this change is expected to occur if this substance is water.
30. Why is blood known as a connective tissue? Write four functions of blood. (3)

OR

- Give two differences between bone and cartilage.
  - Give reason: It is difficult to pull out the husk of coconut.
31. The drawing shows a ship 800m from a cliff. A gun is fired on the ship. After 5 seconds the people at the front of the ship hear the sound of the gun again. (3)



- What is the name of this effect? What should be the minimum time interval between the two sounds for this effect to be heard?
  - How far does the sound travel in 5 seconds?
  - Calculate the speed of the sound.
32. The graph given shows how the speed of a car changes with time (3)



- What is the initial speed of the car?
- What is the maximum speed attained by the car?
- Which part of the graph shows zero acceleration?
- Which part of the graph shows varying retardation?
- Find the distance travelled in first 8 hours.

33. A motorcar of mass 1200 kg is moving along a straight line with a uniform velocity of 90 km/h. Its velocity is slowed down to 18 km/h in 4 sec by an unbalanced external force. Calculate: (3)
- Acceleration
  - Change in momentum
  - Magnitude of force required to slow down the car.

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

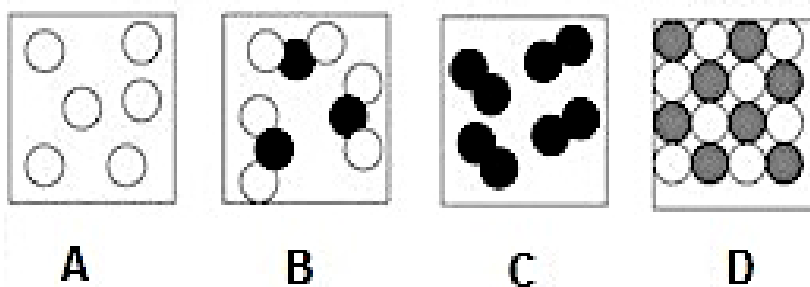
34. (a) A metallic bar has a 200 g mass at poles. Does it change when it is taken to the equator? (5)
- (b) Is there any weight change when the metallic bar is brought to the equator? Justify your answer.
- (c) Suppose gravity of earth suddenly becomes zero, then in which direction will the moon begin to move if no other celestial body affects it?
- (d) Calculate the magnitude of the force of gravitation between two objects if:
- the distance between the objects is tripled?
  - mass of both the objects is doubled?

**OR**

- (a) Define pressure. State its SI unit.
- (b) The cutting edge of a knife should be as sharp as possible. Why?
- (c) What do you mean by buoyancy?
- (d) A toy of mass 100 g has a volume of 25 cm<sup>3</sup>. Find the density of toy. Will the toy sink in water? Give reason. (Density of water is 1 g /cm<sup>3</sup>)
35. (a) During an experiment the students were asked to prepare a 10% (Mass/Mass) solution of sugar in water. (5)
- Ramesh dissolved 10 g of sugar in 100 g of water while
  - Sarika prepared it by dissolving 10 g of sugar in water to make 100 g of the solution.

Calculate the mass % of the two solutions and compare to tell, who has made the solution with the right concentration.

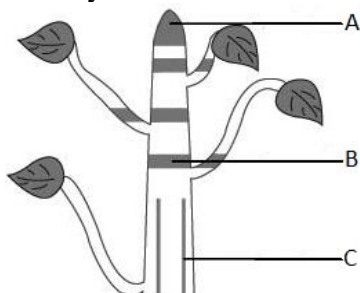
- (b) Out of the four substances 'A', 'B', 'C' and 'D' listed below in the figure, identify element(s), compound(s) and mixture(s).



OR

- (a) State the main points of difference between a mixture and a compound. (Three points).
- (b) List two characteristics of a solution.

36. (a) In the given figure, observe the location of three different types of meristematic tissues A, B and C. Identify these tissues and also write their specific function. (5)



- (b) Give two important functions of epithelial tissue. Name one specific place in the body where each function is carried out.

OR

- (a) Observe the connective tissue shown in the following figure:
- i. Identify its name.
  - ii. State two locations in the body where this tissue is found.
  - iii. Write its two functions.



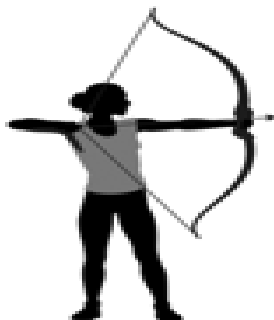
- (b) Name the type of muscular tissue found in limbs and stomach. Write one difference between them.

### 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. Vikas went to see Dussehra fair. Vikas purchased a bow and arrow set from the fair. He tried to play with it but the arrow fell just near the bow. He felt sorry. His brother suggested him that after placing the arrow on bow, he should stretch the string and then release the arrow. Vikas did as suggested by his brother. Now the arrow was flying off the bow with a faster speed and falling far away. (4)

Figure shows an archer with a stretched bow, about to fire an arrow:



- (a) What type of energy is produced in the bow-arrow system when the string of the bow is stretched?
- (b) From where does the kinetic energy of arrow come?
- (c) Certain force acting on a 20 kg mass changes its velocity from 5m/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.

- 38.** Read the table and answer the questions below: **(4)**  
The following data represents the distribution of electrons, protons and neutrons in atoms of five elements A, B, C, D, and E.

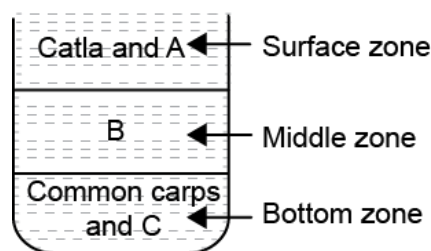
Elements	Protons	Neutrons	Electrons
<b>A</b>	10	10	10
<b>B</b>	11	12	11
<b>C</b>	12	12	12
<b>D</b>	17	18	17
<b>E</b>	17	20	17

- (a) Write valence electrons and electronic configuration of element C.
- (b) Which of them will form monovalent cation? Explain.
- (c) Select a pair of isotopes from the table. State two important applications of isotopes.

**OR**

- (c) Write two isotopes of carbon. The number of which fundamental particle is:  
(i) same                      (ii) different in isotopes of an element?

- 39.** Animal husbandry refers to livestock raising and selective breeding. The animals are bred, cared, reared and sheltered in a farm or region, which are specially built for them. Animal husbandry involves poultry, milk-farms, apiculture (bee agriculture), aquaculture, etc. An intensive fish culture system known as composite fish culture is shown in the given figure: **(4)**



- (a) An Italian bee variety *Apis mellifera* has been introduced in India for honey production. What are its merits over other varieties.
- (b) Differentiate between capture fishery and culture fishery.
- (c) State two advantages of composite fish culture.

**OR**

- (c) Which method is used for improving cattle breeds? Why?