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

DAY & DATE: 9th FEBRUARY' 24, FRIDAY
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. Under which of the given conditions evaporation is expected to be the fastest? **(1)**

	SURFACE AREA	TEMERATURE
(a)	28 cm^2	60°C
(b)	18 cm^2	50°C
(c)	15 cm^2	40°C
(d)	28 cm^2	30°C

2. Chemical changes are: **(1)**
(a) temporary, reversible and a new substance is produced
(b) always accompanied by evolution of light
(c) permanent, irreversible and a new substance is produced
(d) never accompanied by evolution of light and heat energy

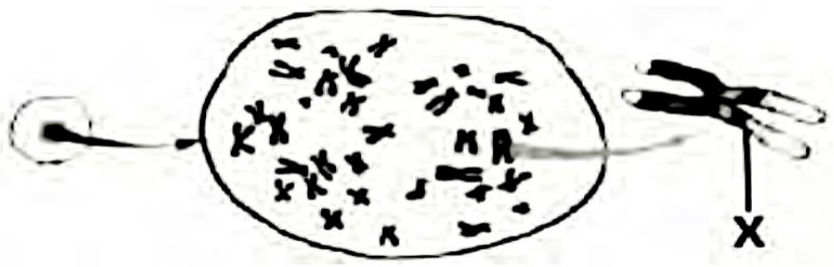
3. In a certain reaction, 24 g of magnesium reacts completely with 16 g of oxygen to give 40 g of magnesium oxide. How much magnesium oxide will be produced if 72 g of magnesium reacts completely with oxygen? **(1)**
(a) 48 g (b) 120 g (c) 80 g (d) Cannot be decided

4. If Z=7, what would be the valency of the element: **(1)**
(a) 6 (b) 2 (c) 4 (d) 5

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. In which of the given cases the rate of diffusion of the particles is the highest? **(1)**
(a) Honey (b) Water (c) Salt solution (d) Smoke

7. The diagram below shows a magnified view of a particular part of a human cell. Name the part labelled X. **(1)**



(a) Ribosome (b) Chromosome (c) Nucleoplasm (d) Mitochondrion

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. The dead element present in the phloem is **(1)**
(a) companion cells
(b) phloem fibres
(c) phloem parenchyma
(d) sieve tubes

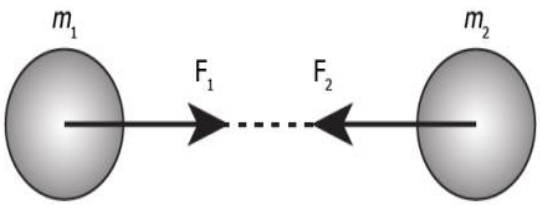
10. The process of growing two or more crops simultaneously in a random manner: **(1)**
(a) crop rotation (b) inter-cropping
(c) mixed cropping (d) organic cropping

11. An exotic breed of cattle: **(1)**
(a) Aseel (b) Leghorn (c) Jersey (d) Sahiwal

12. Suppose a boy is enjoying a ride on a merry-go-round which is moving at a constant speed of 10 ms-1 It implies that the boy is **(1)**
(a) at rest
(b) moving with no acceleration
(c) in accelerated motion
(d) moving with uniform velocity

13. Acceleration is a vector quantity, which indicates that its value **(1)**
(a) is always negative
(b) is always positive
(c) is zero
(d) can be positive, negative or zero

14. The image shows a model of Earth with mass m1 and its moon with mass m2. **(1)**



Based on the model, what should be the magnitude of forces F1 and F2 in accordance with the Newton's third law of motion?
(a) F1 = F2 (b) F1 > F2 (c) F1 < F2 (d) F1 = - F2

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 low pitch sound to high pitch 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):** A cycle can be pushed easily, but the same force is not able to push a bus. **(1)**
Reason (R): Inertia of cycle is more than that of the bus.

18. **Assertion (A):** When you lift a ball from ground to a height of one metre, you do a positive work. **(1)**
Reason (R): Work done by gravity on the ball is negative.

19. **Assertion (A):** Muscles found in heart are involuntary in nature. **(1)**
Reason (R): Smooth muscles are found in heart.

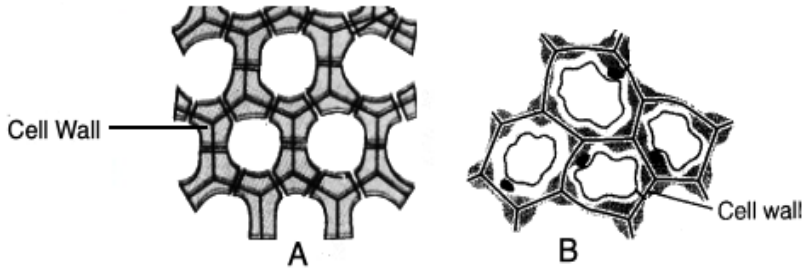
20. **Assertion (A):** The endoplasmic reticulum which lacks ribosomes is called rough endoplasmic reticulum **(1)**
Reason (R): RER is mainly involved in protein synthesis.

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.

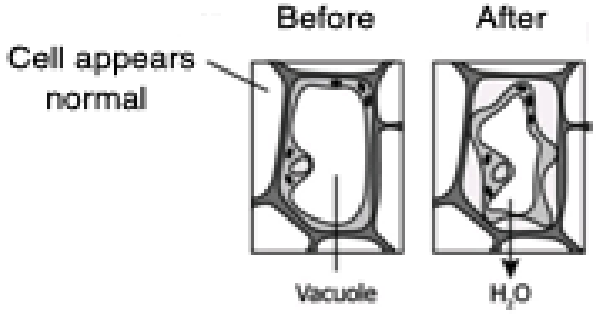
22. (a) Where are chromosomes present in the cell? What is their chemical composition? **(2)**
(b) What is the difference between a nucleus and a nucleoid?

23. (a) Identify and name the tissue '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 Na atom and Na^+ ion ? **(2)**
(b) (b) Draw the atomic structure of Na atom and Na^+ ion

25. The following diagram shows plant cell placed in a solution. **(2)**
Identify the type of solution (hypertonic, hypotonic or isotonic) in which the cell was placed and define the process which has caused the change.



26. A firecracker is fired and it rises to a height of 500 m. Find : **(2)**
(a) velocity by which it was released
(b) time taken by it to reach the highest point [take g= 10 m/s^2]

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

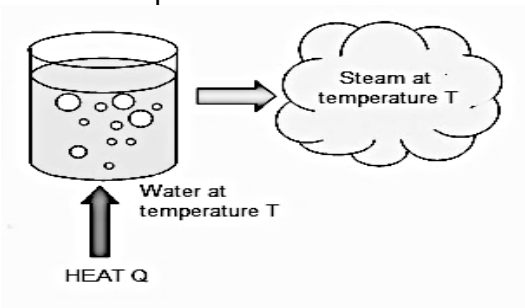
27. (a) Name the organelles which help in: **(3)**
i. energy production
ii. modification, packaging and dispatching of substances
iii. synthesizing food.

(b) Draw a neat diagram of a plant 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) Sodium Sulphate		
(b) Ammonium Hydroxide		

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



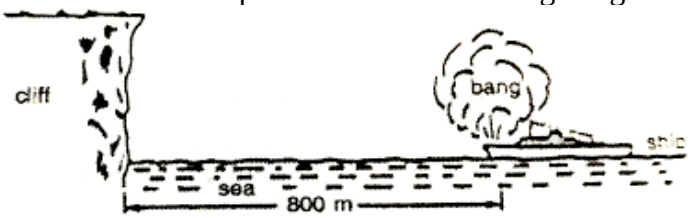
(a) Identify this heat Q and define it.
(b) Why does the temperature remain constant during this change?
(c) State the temperature T (in Kelvin) at which this change is expected to occur if this substance is water.

30. Why is blood known as a connective tissue? Write two functions of blood. **(3)**

OR

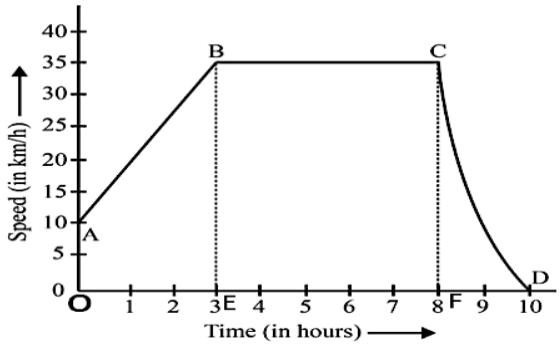
(a) Give two differences between tendons and ligaments.
(b) Give reason: Animals of colder region and fishes of cold water have thicker layer of subcutaneous fat.

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)**



(a) What is the name of this effect? What should be the minimum time interval between the two sounds for this effect to be heard?
(b) How far does the sound travel in 5 seconds?
(c) Calculate the speed of the sound.

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



i. What is the initial speed of the car?
ii. What is the maximum speed attained by the car?
iii. Which part of the graph shows zero acceleration?
iv. Which part of the graph shows varying retardation?
v. 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)**

(a) Acceleration
(b) Change in momentum
(c) 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) Identical packets are dropped from two aeroplanes, one above the equator and the other above the north pole, both at height h. Assuming all conditions are identical, will those packets take same time to reach the surface of earth? 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:
i. the distance between the objects is tripled?
ii. Mass of both objects as well as distance between them is doubled?

OR

(a) Define pressure. State its SI unit.

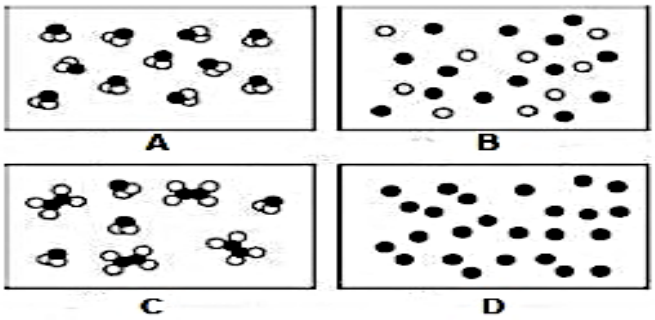
(b) The edge of a drawing pin is sharp and pointed one. Why?

(c) What do you mean by buoyancy?

(d) A toy of mass 100 g has a volume of 25 cm^3. Find the density of toy. Will the toy sink in water? Give reason. (Density of water is 1 g /cm^3)

35. (a) The teacher instructed three students 'A', 'B' and 'C' respectively to prepare a 50% (mass by volume) solution of sodium hydroxide (NaOH). **(5)**
i. 'A' dissolved 50 g of NaOH in 100 mL of water,
ii. 'B' dissolved 50 g of NaOH in 100 g of water while
iii. 'C' dissolved 50 g of NaOH in water to make 100 mL of solution.
Calculate the concentration of solution made by each student and tell which one of them has made the desired solution and why?

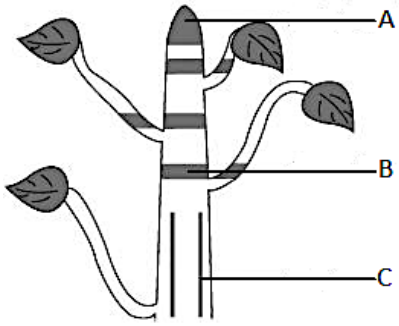
(b) Out of the four substances 'A', 'B', 'C' and 'D' listed below in the figure, identify element(s), compound(s) and mixture(s).



OR

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

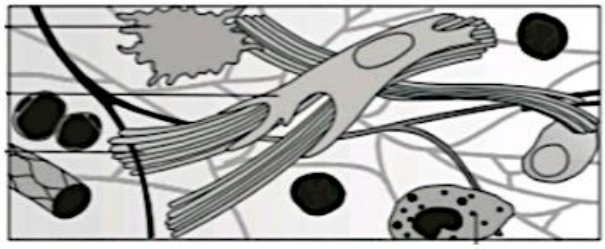
36. (a) In the given figure, observe the location of three different types of meristematic tissues A, B and C. Identify these tissues and also write their specific function. **(5)**



(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.

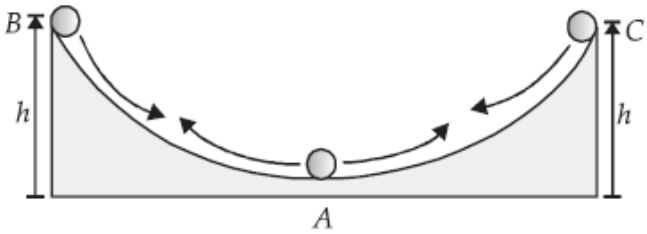


(b) Name the type of muscular tissue found in limbs and heart. Write one difference between them.

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. Figure shows a watch glass embedded in clay. A tiny spherical ball is placed at the edge B at a height h= 10 cm above the centre A. The ball is released and it starts oscillating from B to C through A and vice versa. **(4)**



(a) At which points the kinetic energy of the ball will be maximum and minimum?
(b) A light and a heavy body have equal kinetic energy. Which one is moving faster?
(c) What will be the potential energy of the ball when it reaches at point C, if the mass of the ball is 0.5 kg? ($g = 10 m/s^2$)

OR

(c) Derive the mathematical expression for the potential energy of an object of mass m, when it is raised to a height 'h' from the ground.

38. Read the table and answer the questions below: **(4)**

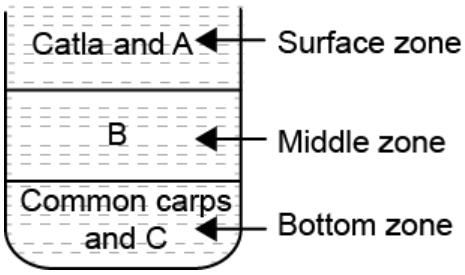
Element	**A**	**B**	**C**	**D**	**E**
Mass No.	1	12	14	40	40
Atomic No.	1	6	7	18	20

(a) Select a pair of isobars from the table.
(b) Name the element from the table in which 2nd shell has twice electrons than 1st shell. Write its chemical name.
(c) Which of them is a noble gas? Why do noble gases have a zero valency?

OR

(c) Write two isotopes of chlorine. Give any two uses of isotopes.

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 broilers and layers.
(c) Which method is used for improving cattle breeds? Why?

OR

(c) What was the major problem faced in composite fish culture? How was this problem overcome?