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VIVEK HIGH SCHOOL, CHANDIGARH
HALF-YEARLY EXAMINATION
2024-25
CLASS 9
SCIENCE (086)
SET A

TIME: 3 Hrs. **MAX. MARKS: 80**

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. Answers 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. There is no negative mark for an incorrect response.

S.no	Question	Marks
1	Four students prepared mixtures in water by taking sugar, sand, chalk powder and starch respectively in four different test tubes. After stirring, the mixture that appeared clear and transparent was that of: a) Starch and water b) chalk powder and water c)sand and water d) sugar and water	1
2	A solution contains 40 g of common salt in 320 g of water. The concentration of the solution is a) 11 b) 11.1 c) 0.111 d) 1.11	1
3	You are provided with a mixture of iron fillings and sulphur powder. When you add carbon disulphide to the mixture, you would observe a) Iron particles dissolves and the solution turns black b) Sulphur powder dissolves and the solution turns yellow c) Sulphur powder dissolves and the solution turns colourless d) Iron particles dissolves and the solution turns grey	1
4	A strip of magnesium metal is burnt in the flame. It is observed that a) A yellow light appears b) A white dazzling light appears c) Magnesium starts melting d) Black smoke is produced	1

5 For determining the melting point of ice, the thermometer should be kept- 1

a) With its bulb in the ice cubes
b) In contact with the inner walls of the beaker
c) A little above the ice cubes
d) In touch with the beaker from outside.

6 A student takes some water in a beaker and heats it over a flame for determining its boiling point. He keeps on taking its temperature reading. He observes that the temperature of the water: 1

a) Keeps on increasing regularly
b) Keeps of decreasing regularly
c) First increases slowly, then decreases rapidly and eventually becomes constant
d) First increases gradually and then become constant

7 When iron nails are kept in copper sulphate solution, after 10 minutes, its blue colour disappears, and the solution appears 1

a) reddish brown
b) blue
c) pale green
d) yellow

8 The Golgi apparatus is involved in: 1

a) Synthesizing proteins
b) Packaging and dispatching materials within and outside the cell
c) Breaking down waste materials
d) Producing energy for the cell

9 An undefined nuclear region of Prokaryotes is known as _____ 1

a) nucleus
b) nucleoid
c) nucleolus
d) nucleic acid

10 In a test, a teacher collected the answers written by four students and the definition of osmosis is given below. Read carefully and select the correct one. 1

a) Movement of water molecules from a region of higher concentration to a region of lower concentration through a semipermeable membrane.
b) Movement of solvent molecules from its higher concentration to lower concentration.
c) Movement of solvent molecules from higher concentration to lower of solution through a permeable membrane.
d) Movement of solute molecules from lower concentration to higher concentration of solution through a semipermeable membrane.

11 1

The plasma membrane of a cell is primarily composed of:

a) Lipids and proteins
b) Carbohydrates and nucleic acids
c) Proteins and carbohydrates
d) Nucleic acids and lipids

12 Tiny pores are found on the surface of the leaves of plants. These pores are called stomata. These stomata surrounded by the kidney-shaped guard cells provide many vital functions to the plants. 1

Which of the following functions is served by the stomata for the plants?

a) Exchange of gases, particularly CO2 and O2, with atmosphere.
b) Loss of water in the form of vapours during transpiration.
c) Helps the leaves to carry out the process of photosynthesis.
d) All of the above

13 A quantity has a value of −6.0m/s. It may be the 1

a) speed of a particle
b) acceleration of a particle
c) velocity of a particle
d) position of a particle

14 Two bodies fall from the same height on the surface of the earth. Which body will strike the surface first? 1

a) heavier body
b) both will reach same at the same time
c) lighter body
d) none of these

15 Tissue is a group of similar kind of cells specialized to perform a particular function in the body. Therefore, presence of tissues in a multicellular organism ensures 1

a) Slow development
b) Higher reproductive potential
c) Division of labour
d) Body strength

16 Engulfing of food materials or foreign bodies by cells like Amoeba is called 1

a) diffusion
b) osmosis
c) endocytosis
d) plasmolysis

Question No. 17 to 20 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: Ice floats on water. 1
REASON: Liquids have lower density than solids. 1

18 ASSERTION-Resin swell up when it is soaked in water. 1
REASON-Hypotonic solution leads resin to swell up.

19 ASSERTION: We feel backward fall due to sudden start of the bus. 1
REASON: Our body opposes the motion of bus due to inertia.

20 ASSERTION: All plants and animals are composed of cells. 1
REASON-Cell is the basic unit of life.

Section-B

Question No. 21 to 26 are very short answer questions

21 Classify the following mixtures as homogeneous and heterogeneous: 2

i)Tincture of iodine ii) Smoke iii) Brass iv) chalk powder in water

22 In which situations parenchyma is called chlorenchyma and aerenchyma? Give 1 point for each. 2

23 Which part of the cell controls most of the activities of the cell and why? 2

Or

Why are lysosomes known as 'suicide-bags' of a cell?

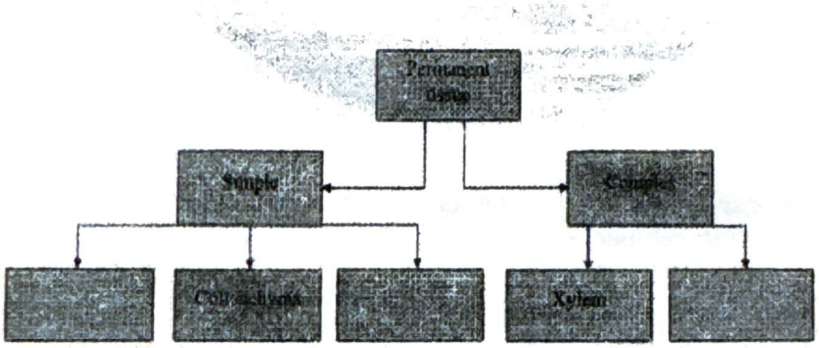
24 Identical packets are dropped from two aeroplanes—one above the equator and other above the north pole, both at height h. Assuming all conditions to be identical, will those packets take same time to reach the surface of earth? Justify your answer. 2

25 State the reason: A person is hit harder, when the person falls on a hard floor than when he falls on sand or cotton. 2

Or

How much momentum will an object of mass 10 kg transfer to the floor if it falls from a height of 5 m? ($g = 10\ m/s^2$)

26 a. Complete the table: 2



b. The tissue which makes the husk of coconut hard, and stiff is due to presence of a chemical substance called _____

Section-C

Question No. 27 to 33 are short answer questions

27 List three reasons to support that water is a compound and not a mixture. 3

28 Distinguish true solution, suspension and colloid in a tabular form under the following characteristics-: 3

i) Stability
ii) Tyndall effect
iii) Filterability

OR

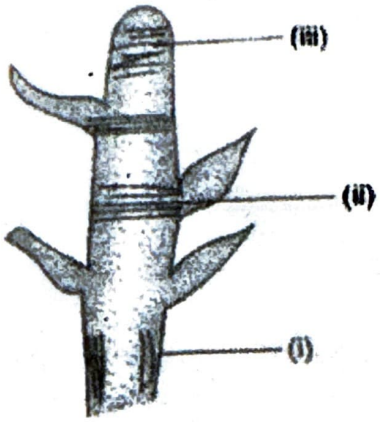
How will you prepare a 10% solution of glucose in water?

Identify the physical and chemical changes from the following:

i. Melting of ice
ii. Corrosion of iron
iii. Sublimation of ammonium chloride
iv. Electrolysis of water

29 What is the role of epidermis in plants. Give 3 points 3

30 Label the following and give function of each part labelled (i), (ii) and (iii) 3



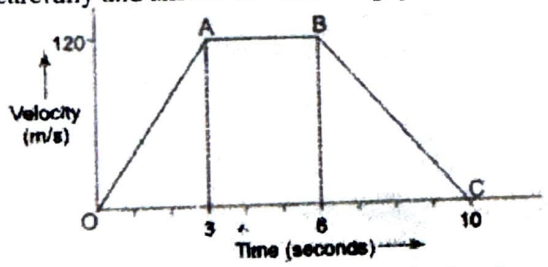
3

31 a. State Newton's First law of motion 3

b. Prove that Newton's first law of motion is a special case of Newton's second law of motion.

Or

The velocity-time graph of an object of mass m = 50 g is shown in figure. Observe the graph carefully and answer the following questions.



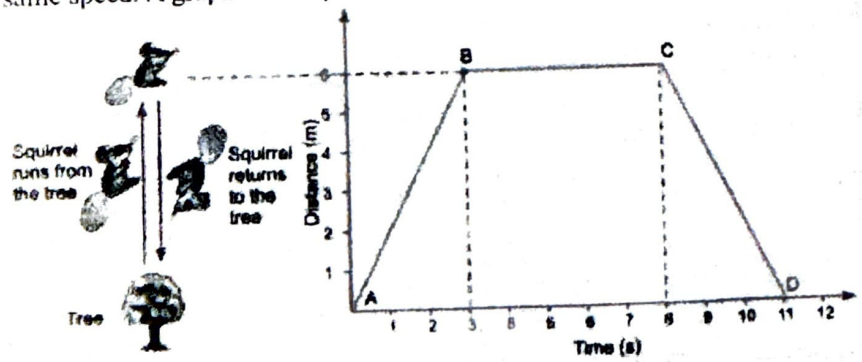
(a) Calculate the force on the object in time interval 0 to 3 s.

(b) Calculate the force on the object in the time interval 6 to 10 s.

(c) Is there any time interval in which no force acts on the object? Justify your answer.

32 A stone dropped from the roof of a building takes 4s to reach the ground. Calculate the height of the building. Take g=9.8 m/s^2 3

33 Suppose a squirrel is moving at a steady speed from the base of a tree towards some nuts. It then stays in the same position for a while, eating the nuts, before returning to the tree at the same speed. A graph can be plotted with distance on the x-axis and the time on y-axis. 3



Observe the graph carefully and answer the following questions.

(i) Which part of the graph shows the squirrel moving away from the tree?

(ii) Name the point on the graph which is 6 m away from the base of the tree.

(iii) Which part of the graph shows that the squirrel is not moving?

Section-D

Question No. 34 to 36 are long answer questions

34 5

a) State one similarity and one difference between evaporation and boiling.

b) List four factors that affect the rate of evaporation.

c) Describe an activity to show that water vapour is present in air.

OR

Distinguish between solids, liquids and gases in a tabular form under the following characteristics-

i) Inter-particle forces of attraction

ii) Rigidity

iii) Compressibility

iv) Kinetic energy of particles

v) Density

35 5

Draw a neat diagram of a plant cell and label only three parts which differentiate it from an animal cell. Also, write one feature **or** function of each of these 3 parts of a plant cell.

OR

a. Tissue A and tissue B constitute tissue C. A carries water while B carries food for the plants. Identify A, B, and C.

b. Name A's only living component and B's only dead component.

c. List any two characteristics of cork. How is it formed?

36 5

a. Derive mathematical formulation of the second law of motion.

b. A body starts to slide over a horizontal surface with an initial velocity of 0.5 m/s. Due to friction, its velocity decreases at the rate 0.05 m/s^2. How much time will it take for the body to stop?

OR

a. Shaking of a wet cloth helps to remove water from the cloth, how?

b. A hockey ball of mass 200g traveling at 10ms is struck by a hockey stick so as to return it along its original path with a velocity at 5m/s. Calculate the change of momentum that occurred in the motion of the hockey ball by the force applied by the hockey stick.

Section-E

Question No. 37 to 39

The following questions are case based questions. Read the case carefully and answer the questions that follow.

37. 4

Temperature can be expressed in three important scales. These are Celsius scale (°C), Fahrenheit scale (°F) and Kelvin scale (K). Kelvin scale is often used to express temperature in scientific data. Temperature in any one scale can be easily converted into another scale. If x is the temperature on Celsius scale, then x°C = (x+273) K

Answer the following questions using above information

i) What is the boiling point of water in Kelvin scale?

a) 0 K b) 0°C c) 373 K d) 273°C

ii) Freezing point of water is

a) 0 K b) 0°C c) 373 K d) 273°C

iii) If temperature of certain oil is 65°C, what is the corresponding temperature on Kelvin scale?

OR

iii) What is meant by boiling point of a substance? Why does the temperature of a substance not change at its melting or boiling point?

38. Meristematic tissue takes up a specific role and lose the ability to divide. As a result, they form a permanent tissue. This process of taking up a permanent shape, size, and a function is called differentiation. Differentiation leads to the development of various types of permanent tissues. 4

Simple Permanent Tissue: Tissue made of one type of cells, which look like each other. Such tissues are called simple permanent tissue. It consists of relatively unspecialised cells with thin cell walls. They are living cells. They are usually loosely arranged, thus large spaces between cells (intercellular spaces) are found in this tissue. This tissue generally stores food.

Complex tissues are made of more than one type of cells. All these cells coordinate to perform a common function. Xylem and phloem are examples of such complex tissues. They are both conducting tissues and constitute a vascular bundle. Xylem fibres are mainly supportive in function. Phloem transports food from leaves to other parts of the plant. Except phloem fibres, other phloem cells are living cells.

(1) Tissue made of only one type of cell is termed as _____
(a) Simple permanent tissue
(b) Complex permanent tissue
(c) Simple Meristematic tissue
(d) Complex Meristematic tissue

(2) Xylem and phloem are examples of
(a) Meristematic tissue
(b) Simple tissue
(c) Protective tissue
(d) Complex tissue

(3) What is the function of simple permanent tissue?
(4) What is meant by Differentiation?

Or

(4) When does meristematic tissue becomes a permanent tissue?

39. 4

The third law of motion states that when one object exerts a force on another object, the second object instantaneously exerts a force back on the first. These two forces are always equal in magnitude but opposite in direction. These forces act on different objects and never on the same object. It is important to note that even though the action and reaction forces are always equal in magnitude; these forces may not produce accelerations of equal magnitudes, this is because each force acts on a different object that may have a different mass. The two opposing forces are also known as action and reaction forces. Answer the following questions.

(i) What do you mean by reaction force?
(ii) Can action-reaction forces act on the same object? If no, then what is the condition for action-reaction forces?
(iii) State third law of motion.
(iv) Give 1 example of third law of motion.

OR

(iv) Even though the action and reaction forces are always equal in magnitude; these forces may not produce accelerations of equal magnitudes. Give your justification on this statement.