Sample Paper 1
Solved

विज्ञान
SCIENCE

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 type questions carrying 2 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 3 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 5 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 4 marks each with sub-parts.

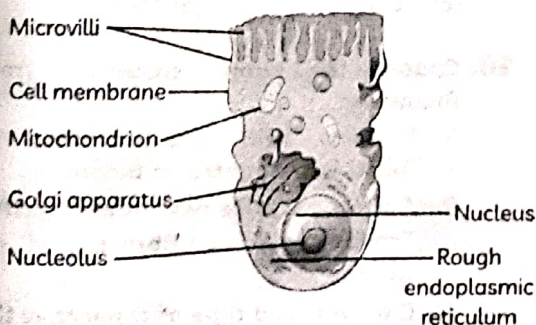## SECTION - A   20 Marks

(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 incorrect response.)

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

2. Outer surfaces of some cells are folded into finger-like projections as shown in the figure given below. Which of the following would be the function of such folded surfaces?

Microvilli
Cell membrane
Mitochondrion
Golgi apparatus
Nucleolus
Nucleus
Rough endoplasmic reticulum

(a) To increase the energy production of cell.
(b) To increase the rate of cell division of the cell.
(c) Increases the cell's ability to absorb nutrients.
(d) To help in the movement of the cell more effectively.   1

3. If masses of two objects are halved without changing the distance between them, then the gravitational force would become:
(a) $\dfrac{F}{4}$ (b) $\dfrac{F}{2}$
(c) 2F   (d) F   1

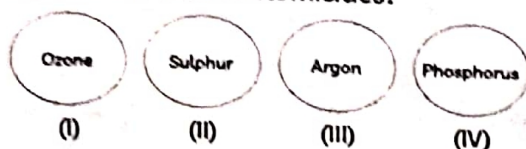**4.** When a body falls freely towards the Earth, then its total energy:
(a) increases
(b) decreases
(c) remains constant
(d) first increases and then decreases   1

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5. From the following elements, which has the highest and lowest atomicities?

Ozone	Sulphur	Argon	Phosphorus
(I)	(II)	(III)	(IV)

Options:

(a) (I) and (II)
(b) (IV) and (III)
(c) (II) and (III)
(d) (II) and (IV)   1

6. The mass of the object is 'm' and velocity is 'v'. If the mass is made four times and the velocity is halved, what will be the relation between original and new momentum?

(a) Double the original momentum
(b) Half the original momentum
(c) One-fourth of the original momentum
(d) No change   1

7. The stored energy in a clock's oscillating pendulum is:

(a) potential energy
(b) kinetic energy
(c) mechanical energy
(d) thermal energy   1

8. Which of the following are true for an element?

(I) Atomic number = number of protons + number of electrons
(II) Mass number = number of protons + number of neutrons
(III) Atomic number = number of protons = number of neutrons
(IV) Atomic number = number of protons = number of electrons

Options:

(a) (I) and (II)
(b) (I) and (III)
(c) (II) and (III)
(d) (II) and (IV)   1

9. A girl stands on a box having 60 cm length, 40 cm breadth and width 20 cm in three ways. In which of the following cases, pressure exerted by the box will be maximum:

(a) when length and breadth form the base.
(b) when breadth and width form the base.
(c) when width and length form the base.
(d) or the same in all the above three cases.   1

10. An ionic compound will be formed by the combination of one of the following pairs of elements. This pair of element is:

(a) (Ba), (O)
(b) (S), (C)
(c) (H), (H)
(d) (Cl), (Cl)   1

11. A gardener rolls a grass roller over a 30 meter span. Find the work done by him if he applies a force of 20 kg in a direction inclined at 30° to the ground. ($g = 9.8$ m/s^2)

(a) 7638 J
(b) 7960 J
(c) 4410 J
(d) 2514 J   1

12. Before playing the orchestra in a musical concert, a sitarist tries to adjust the tension and pluck the string suitably. By doing so, he is adjusting the:

(a) intensity of sound only
(b) amplitude of sound only
(c) frequency of the sitar string with the frequency of other musical instruments
(d) loudness of sound   1

13. Angelina throws a stone of 2 kg on the frozen lake with a velocity of 20 m/s. The stone comes to rest after travelling a distance of 40 m. Choose the option which correctly describes the force required to stop the moving stone.

(a) Frictional force, 10 N
(b) Gravitational force, 10 N
(c) Inertia of rest, 10 N
(d) Frictional force, –10 N   1

14. The value of acceleration due to gravity 'g':

(a) is same on equator and poles
(b) is least on poles
(c) is least on equator
(d) increases from pole to equator   1

15. What is the percentage of solute if the solution is 500 mL and the solvent is 300 mL?

Solvent = 300 mL
Solute % = ?
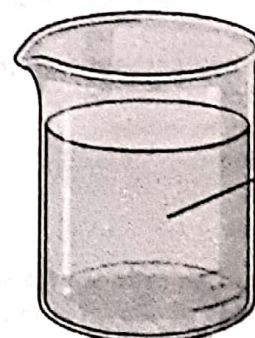
(a) 30%
(b) 40%
(c) 50%
(d) 60%   1

16. Choose the wrong statement from the following:

(a) Proteins, salts, and hormones are all found in the matrix of blood.
(b) A ligament joins two bones together.
(c) Tendons are non-fibrous and delicate tissue.
(d) Cartilage is a type of connective tissue.   1

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Q. 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 (A): A. mellifera bee is used for commercial honey production.

Reason (R): A. mellifera not only have high honey collection capacity but also they breed very well. 1

18. Assertion (A): Isotopes show the same chemical properties.

Reason (R): Since different isotopes have the same electronic configurations, they have the same chemical properties. 1

19. Assertion (A): Muscles are connected to bones by tendons.

Reason (R): Tendons are tough, inelastic bundles which connect skeletal muscles with bones. 1

20. Assertion (A): The value of displacement can be negative, positive and zero, whereas distance gives a positive value.

Reason (R): Displacement is a vector quantity and distance is a scalar quantity. 1

SECTION - B

12 Marks

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

21. Broiler production is indeed a solution to increase the production of nutritious animal protein food. List any four factors that need to be considered for broiler production. 2

22. (A) Camphor disappears with time without leaving any solid. Justify your answer by providing a suitable reason.

(B) The gases diffuse quickly. Give reason. 2

23. Observe the diagram of a neuron given below and label the parts (A) to (D).
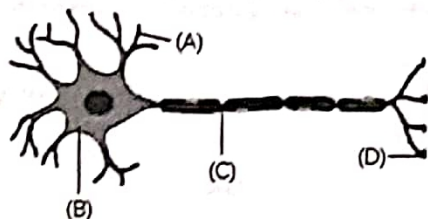
OR

The given image shows stem of a plant.

(A) Which type of meristematic tissue is present in part labelled as X?

(B) State any one role of tissue X. 2

24. A man weighing 400 N lifted a weight 200 N upto flight of stairs 3 m high in 3 seconds. Calculate the power of the man. 2

25. (A) Damini's mother wanted to make mango pickle. She asked Damini to cut the tender mango into four and smear it with common salt and keep it for some time. She did so and observed that after sometime, the mango had started to lose water and the pieces had shrunk in size. Name the phenomenon observed by Damini.
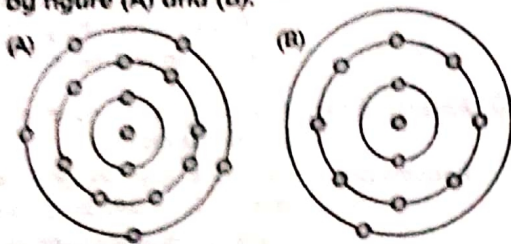

(B) Plasma membrane is a double-membraned cell organelle which surrounds the cell and its organelles. What would happen if this plasma membrane ruptures or breaks down? 2
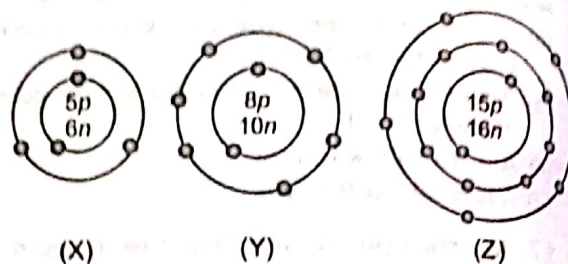
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26. Find out the valency of the atoms represented by figure (A) and (B).

(A)

(B)

number, and valency of atoms X, Y and Z?
Give your answer in a tabular form.

5p
6n

8p
10n

15p
16n

(X)   (Y)   (Z)

2

OR

What information do you get from the given figure about the atomic number, mass

SECTION - C   21 Marks

(Question no. 27 to 33 are short answer questions.)

27. How do grain losses in storage happen?   3

28. (A) Smoke and fog both are aerosols. Can you give reason in what way are they different?

(B) How would you know if a colourless liquid you were given, was pure water?   3

29. Analyse the below situations and give reasons for the following:

(A) We get a crunchy and granular feeling when we chew pear fruit.

(B) Branches of a tree move and bend freely in high wind velocity.

(C) Intercellular spaces are absent in sclerenchymatous tissues.   3

30. (A) What do you observe in the given case below. State reason why? Name the law involved in this case.
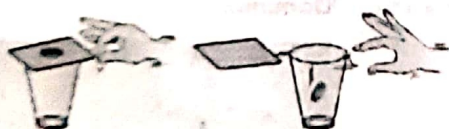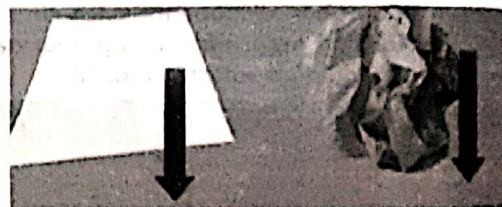
(B) Define the term inertia.

OR

Give one example for each - inertia of rest, inertia of motion and inertia of direction.   3

31. (A) The volume of 50 g of a substance is 20 cm^3. If the density of water is 1 g/cm^3, will the substance float or sink?

(B) Why will a sheet of paper fall slower than one that is crumpled into a ball?

3

32. What is the difference between a bacterial cell and an onion peel cell?   3

33. (A) In chemistry class, teacher asked Nina that the electronic configuration of Fluoride ion and Neon is the same. Then what is the difference between them?

(B) Why do inert gases have zero valencies?

(C) Name three isotopes of Hydrogen.   3

SECTION - D   15 Marks

(Question no. 34 to 36 are long answer questions.)

34. Represent graphically by two different diagrams in each case.
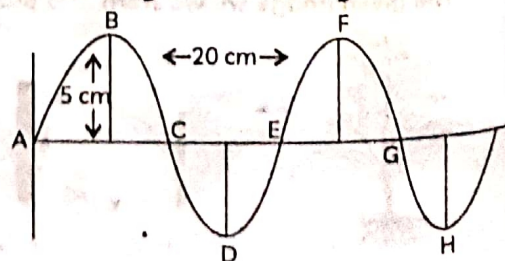
(A) Two sound waves having the same amplitude but different frequencies.

(B) Two sound waves having the same frequency but different amplitudes.

(C) Two sound waves having different amplitudes and also different wavelengths.

OR

(A) Waves of frequency 100 Hz are produced in a string as shown in figure.

B   ←20 cm→   F

5 cm

A   C   E

G

D   H

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Give its:
(i) Amplitude
(ii) Wavelength
(iii) Velocity

(B) How do the following factors affect the speed of sound in air?
(i) Air frequency
(ii) Air temperature
(iii) Air pressure
(iv) Moisture   5

35. (A) What are the two ways in which the physical states of matter can be changed?

(B) Draw the states of matter triangle to show the interconversion of states of matter.

(C) How can the evaporation of a liquid be made faster?

OR

Teacher plays a riddle in class "There are 5 different types of matter named P, Q, R, S, T. P has no definite shape and volume but it can be compressed easily. Q has a definite shape, size, and volume. Its diffusion rate is negligible. R is found by cooling a gas at extremely low density and it is named after a great physicist and Indian Scientist. S gives glow to the sun and star. T has definite volume but no shape."

(A) Name all the states of matter describe in the riddle.

(B) Name the process through which Q can be obtained directly from P.

(C) Name one substance which belongs to Q but whose solid form changes into a gaseous state.

(D) Name the Indian Scientist and physicist who predicted the fifth state of matter.

(E) Name the common substance belonging to T.   5

36. Draw the structure of a plant cell and label the parts which:

(A) have cisternae like structures for transport and synthesis.

(B) is a place where most biochemical reactions occur.

(C) packages and delivers the material synthesised in a cell.

(D) acts as kitchen of the cell.

(E) Also differentiate this cell from an animal cell based on:
(i) Outer membranes
(ii) Presence of centrioles

OR

(A) What is the reason behind the structural strength of a plant cell?

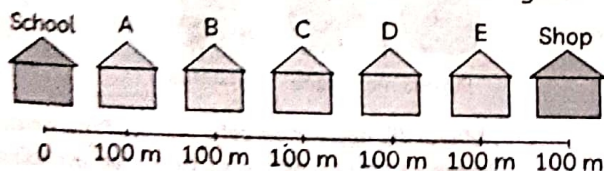(B) Write any three functions of the cell wall?   5

SECTION - E   12 Marks

(Question no. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.)

37. There were five houses of A, B, C, D and E in between school and shop as shown in Figure.

School A   B   C   D   E   Shop

0   100 m 100 m 100 m 100 m 100 m 100 m

(A) A was invited to a birthday party at C house. So, A visited the shop to buy chocolate before entering C's house. What is A's total displacement and distance? 2

(B) D walks to school with B and then walks home after school. What is D displacement, and how far has he travelled?

OR

(B) Write the difference between distance and displacement.   2

38. Several natural sources yield a liquid chemical X with a molecular mass of 18 amu. Liquid X is required for the life of all creatures and plants. When an electric current is carried through 100 grams of pure liquid X, 78 grams of gas Y and 22 grams of gas Z are created under ideal conditions. The positive electrode produces gas Y, while the negative electrode produces gas Z. Furthermore, gas Y promotes combustion, whereas gas Z self-combusts, resulting in explosions.

(A) Can the law of conservation of mass be violated?   1

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(B) Write the balanced equation of liquid X when electrolysis is done. 1

(C) Name the following:
   (i) liquid X
   (ii) gas Y
   (iii) gas Z

OR

(C) In liquid X, find the ratio of mass of element Z to the mass of element Y. 2

39. Kanav was riding a bicycle on a road, suddenly he banged into a standing car and fell from his cycle. Passers by saw Kanav struggling to stand, they helped him stand and dropped him home. On reaching home, he realised that his leg was paining severely and developed swelling. His parents rushed him to the orthopedician who is specialised in bone and muscle injuries. An X-ray was done to see the condition of his injured leg. Given below is the X-ray scan of his right leg.

(A) Which part of his leg is injured? 1

(B) Doctor plastered the injured leg and prescribed some medicines for faster healing. Which minerals will be the main constituent of these medicines? 1

(C) Give two structural features of bones.

OR

(C) Differentiate between tendon and ligament. 2

SOLUTIONS