Date : 12/03/2024
Time : 3 hrs.

CLASS : IX
SUBJECT : SCIENCE

Max. Marks : 80
No. of Pages : 08

Name: _____ Roll No _____ Class_____ Sec_____

General Instructions:

➢ *This question paper consists of 39 questions in 5 sections.*

➢ *All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*

➢ *Section A consists of 20 objective type questions carrying 1 mark each.*

➢ *Section B consists of 6 Very Short questions carrying 02 marks each.*

➢ *Section C consists of 7 Short Answer type questions carrying 03 marks each.*

➢ *Section D consists of 3 Long Answer type questions carrying 05 marks each.*

➢ *Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

SECTION A

Q1. The forces of attraction between particles are maximum in :- (1)

    (a)   water   (b) ice

    (c)   water vapour   (d) neither maximum nor minimum but equal

Q2. Which of the following is an example of colloidal solution? (1)

    (a)   lemonade   (b) milk

    (c)   copper sulphate solution   (d) water in salt

Q3. The elements which become liquid at a temperature of 300 K are :- (1)

    (a)   gallium and cesium   (b)   chromium and cesium

    (c)   chromium and gallium   (d)   Barium and gallium

Q4. A and B were two substances that were mixed to create A_2B. The reaction was $2A + B \rightarrow A_2B$. Which of these statements regarding this reaction is incorrect? (1)

    (i)   Product A_2B shows the properties of substances A & B.

    (ii) The product will always be of a fixed composition

    (iii) The product thus formed cannot be classified as a compound. †

    (iv) A product is formed when it contains an element.

    (a)   (i),(ii) or (iii)   (b) (ii),(iii), and (iv)

    (c)   (i),(iii), and (iv)   (d) (ii),(iii), and (iv)

Q5. What is the maximum number of electrons in L shell? (1)

    (a)   32   (b) 10

    (c)   18   (d) 8

Q6. Hydrogen exists in three isotopic forms, known as protium, deuterium and tritium. Why are all the isotopes neutral in nature? (1)
- (a) Since neutrons are neutral in nature hence isotopes are electrically neutral.
- (b) All the isotopes have one electron and one proton, hence they are neutral.
- (c) All the isotopes have one proton and one neutron, hence they are neutral.
- (d) Increasing number of protons in the isotopes make them neutral.

Q7. At what temperature water changes to solid state? (1)
- (a) 573K
- (b) 473K
- (c) 373K
- (d) 273K

Q.8 Which of the following statements is correct about following cell division? (1)
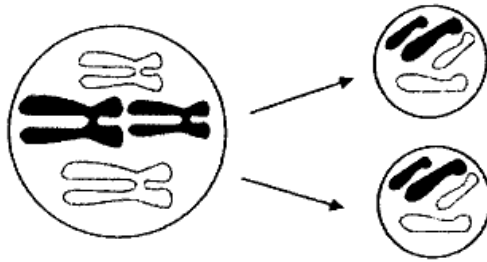
- (a) This cell division is involved in the formation of gametes.
- (b) In this cell division the new cells have half the number of chromosomes as that of the mother cells.
- (c) In this cell division the daughter cells have the same number of chromosomes as the mother cell.
- (d) In this cell division four new cells are formed.

Q.9 Choose the correctly matched pair (1)
- (a) Inner lining of oesophagus-Ciliated epthelium —
- (b) Moist surface of buccal cavity-Glandular epithelium
- (c) Tubular parts of nephrons-Cuboidal Epitheium
- (d) Inner surface of bronchioles-Squamous epthelium

Q.10 Which of the following combination will give maximum yield in mixed cropping? (1)
- (a) Wheat+groundnut
- (b) Wheat+gram
- (c) Oat +rice
- (d) Wheat + maize

Q.11 Which of the following is function of Golgi body? (1)
- (a) Synthesis of proteins
- (b) Synthesis of lipids
- (c) Storage, modification and packaging of substances manufactured in cell
- (d) Directs the life processes of cell

Q.12 Which one of the following fishes is surface feeders? (1)
- (a) Rohus
- (b) Mrigals
- (c) Common carps
- (d) Catlas

Q.13 Sound waves in air is an example of _____ (1)
- (a) Longitudinal wave
- (b) Transverse wave
- (c) Electromagnetic wave
- (d) None of the options

Q.14 Study the given diagram and select the correct statements regarding A,B,C and D.   (1)
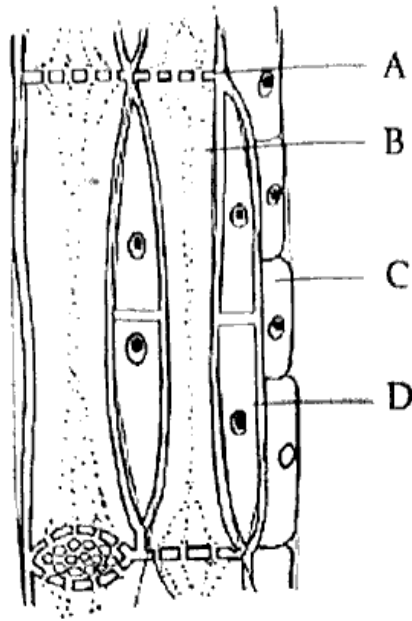
(a)   'C' cells are made of dead cells and provides mechanical support to B.
(b)   'D' is made of nonliving and is involved in transportation of water.
(c)   'B' is tubular cell involved in conduction of food.
(d)   'A' cells are made of dead cells and is involved in transportation of water. ✗

Q.15 Upthrust on a body immersed completely in the water is equal to   (1)
(a)   the weight of the body.
(b)   the weight of the water displaced.
(c)   the weight of the water in which the body is immersed.
(d)   None of these

Q.16 Which of the following is true about the advantage of genetically modified crop?   (1)
(i)   It increases quality and quantity of crops.
(ii)   It helps to overcome the shortage of food.
(iii)   It produces disease resistant crops.

(a)   i, ii,   (b) ii & iii
(c)   i & iii   (d) i, ii &iii

The following questions consist of two statements- Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:
Both A and R are true and R is the correct explanation of A.
Both A and R are true but R is not the correct explanation of A.
A is true but R is false.
A is false but R is true.

Q.17 Assertion (A): Atomicity of ozone is three while that of oxygen is two.
        Reason (R): Atomicity is the number of atoms constituting a molecule.   (1)

Q.18. Assertion (A): The plant cells have large vacuole.
        Reason (R): Vacuole provides turgidity to the plant cell.   (1)

Q.19 Assertion (A): Crop rotation is the practice of growing two or more varieties of crops in the same region in sequential seasons.

Reason (R): Cauliflower and chilli plants grown together in alternating rows are examples of crop rotation. **(1)**

Q.20 Assertion (A): The kinetic energy, with any reference, must be positive.

Reason (R): In the expression for kinetic energy, the velocity appears with power 2 and mass is a scalar quantity. **(1)**

SECTION B

Q.21 What is the significant difference between a compound and an ordinary mixture?

OR

Is water an element or a compound? Give reason in support of your statement. **(1+1=2)**

Q.22 (a) How do water move in and out of the cell?

(b) Why are plastids able to make their own proteins? **(1+1=2)**

Q.23 Compare the use of manure and fertilizer in maintaining the soil fertility.(any two) **(2)**

Q.24 (i) What will happen to the gravitational force between two bodies if the masses of one body is doubled?

(ii) If the mass of a body is 9.8 kg on the earth, what would be its mass on the moon? **(1+1=2)**

OR

(i) At what place on the earth's surface is the weight of a body minimum?

(ii) The earth attracts an apple. Does the apple also attract the earth? If it does, why does the earth not move towards the apple? **(1+1=2)**

Q.25 State the Universal law of gravitation. Write its two important applications. **(2)**

Q.26 (a) What will happen when a red blood cell is kept in concentrated saline solution?

(b) What is membrane biogenesis? Which organelle play an important role in this process? **(1+1=2)**

SECTION C

Q.27 Give reason why:-

(a) Evaporation causes cooling?

(b) We see water droplets on the outer surface of a glass containing ice cold water?

(c) Solids have a regular geometrical shape? **(1+1+1=3)**

OR

(a) Can a rubber band change its shape on stretching? Is it a solid?

(b) Why steam at 100°C is better for heating purposes than water at 100°C?

(c) Which gas is called dry ice? Why?

Q.28 (a) Define concentration of solution.

(b) A solution contains 30 g of glucose, 20 g of salt in 500 ml of water. Calculate the mass percent of

(i) glucose (ii) salt (Note:- density of water = 1 g /ml) **(1+2=3)**

OR

Nonmetals are often poor conductors for heat and electricity. They are not lustrous, non-sonorous, and non-malleable.

(a) Name a non metal that is lustrous.

(b) Name a non metal that exists as a liquid at room temperature.

(c) Name a non-metal that is needed for combustion. (1+1+1=3)

Q.29 (a). What is nucleoid?

(b) How is endoplasmic reticulum important for membrane biogenesis?

(c) How does an amoeba obtain its food? (1+1+1=3)

Q.30 Answer the questions with respect to the given figure.

(a) Identify any two parts marked (a) to (c).

(b) Name the part that is responsible for elongation of the stem and secondary growth?

(c) Write any one identifying features of meristematic tissue? (1+1+1=3)
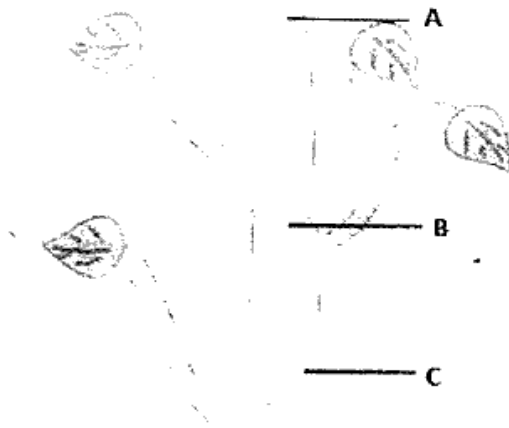
Q.31 (a) The lawn sprinkler starts rotating as soon as the water is added. Explain the principle on which it works.

(b) Explain how a horse can pull a cart if action is always equal to the reaction. (1+2=3)

Q.32 (a) When an arrow is shot from its bow, it has kinetic energy. From where does it get the kinetic energy ? https://www.cbseboardonline.com

(b) A body of mass m is raised to a vertical height h through two different paths A and B. What will be the potential energy of the body in the two cases? Give reason for your answer. (1+2=3)
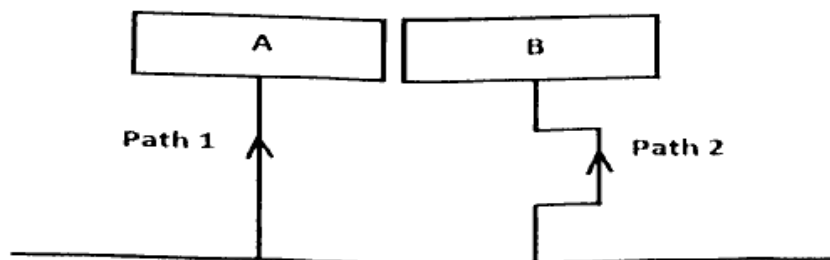
Q.33 (a) An automobile vehicle has a mass of 1500 kg. What must be the force between the vehicle and road if the vehicle is to be stopped with a negative acceleration of 1.7 ms^{-2}?

(b) Write the statement of Newton's second law of motion.

(c) What would be the force required to produce an acceleration of 2 m/s^2 on a body of mass 12 kg.

OR

(a) Calculate the change in momentum of a body weighing 5 kg when its velocity decreases from 20 m/s to 0.20 m/s.

(b) A stone released from the top of a tower of height 19.6 m. Calculate its final velocity just before touching the ground.

(c) State the Newton's first law of motion. **(1+1+1=3)**

SECTION-D

Q.34 Neils Bohr got the Nobel Prize for his work on the structure of atom in 1922. Among Professor Bohr's numerous writings, three appearing as books are: (i) The Theory of Spectra and Atomic Constitution, (ii) Atomic Theory and, (iii) The Description of Nature. Bohr's findings play a pivotal role in establishing the structure of atom. In order to overcome the objections raised against Rutherford's model, Neil's Bohr put forward his postulates about the model of an atom.

Answer the following on the basis of above comprehension: -

(a) If an element 'X' has 6 electrons in L shell, identify the element & its atomic number?

(b) Draw the diagram of a metal present in common salt showing its electronic distribution. Also mention its atomic number.

(c) Enlist the two important postulates of Bohr's model of an atom.

OR

(a) Na$^+$ has completely filled K and L shells. Explain.

(b) If Bromine atom is available in the form of two isotopes ^{79}Br (49.7%) and ^{81}Br (50.3%). Calculate the average atomic mass of bromine atom.

(c) Give two points of difference between isotopes and isobars? **(1+2+2=5)**

Q.35 Study the given diagram and answer the following questions-
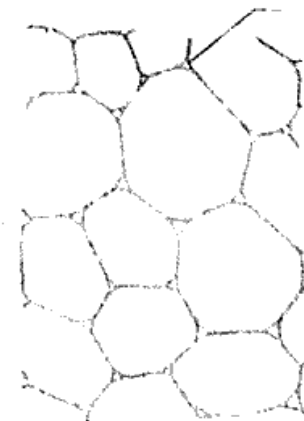
(a) A plant tissue is observed under a microscope, as shown in the figure given above. Identify the tissue.

(b) Name any two parts of plant where this tissue is present.

(c) Write any three characteristics of these cells. (1+1+3=5)

OR

(a) Name the tissue that gives buoyancy to the lotus plant.

(b) Name the kinds of muscles found in limbs and alimentary canal. How are they functionally different?

(c) Differentiate between cartilage and bone on the basis of chemical composition? (1+2+2=5)

Q.36 (a) When we put our ear to a railway track, we can hear the sound of an approaching train even when the train is far off but its sound cannot be heard through air. Why?

(b) Two sound waves are shown below:
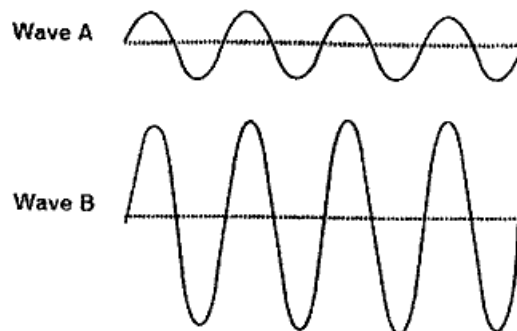
which of the two wave corresponds to louder sound?

(c) Write any two applications of ultrasound.

(d) A sound wave has a frequency 2 kHz and wavelength 40 cm. How long will it take to travel 1.6 km? (1+1+1+2=5)

OR

(a) Calculate the wavelength of a sound wave whose frequency is 220 Hz and speed is 440 m/s in a given medium.

(b) In which of the three media, air, water or iron, does sound travel the fastest at a particular temperature?

(c) What is the audible range of the normal human ear?

(d) The frequency of a source of sound is 100 Hz. How many times does it vibrate in a minute?

(e) Why is a sound wave called a longitudinal wave? (1+1+1+1+1=5)

SECTION-E

Q.37 (a) Differentiate between molecule of an element and molecule of a compound. Give example of each.

(b) Write the cations and anions present in CH_3COONa and $NaCl$.

(c) Name the 2 scientists who established the laws of chemical combination.

OR

(a) Define atomicity. Calculate the atomicity of H_2SO_4.

(b) In a chemical reaction 150 g Baking soda mixture containing sodium bicarbonate and vinegar on heating gives 87 g of carbon dioxide gas. What mass of solid residue will left in food?

(c) Write the chemical formula and calculate the molecular mass of calcium carbonate. (2+1+1)

Q.38 Pisciculture or fish farming is a process of breeding, raising, and transporting of fishes for domestic and commercial purposes. Fishes top the list when it comes to healthy and nutritional food options as they are a rich source of proteins and other minerals. Monoculture allows farming a single species of fish. It offers high production and quality. These fishes are popular among consumers. Usually, in India, an example of monoculture fish is shrimp. Polyculture is also called composite or mixed fish farming. Polyculture lets rearing different species of compatible fishes in a shared pond. Different fish farms use different methods. Fish farming does not require a lot of resources; a small concrete tank is enough to start with. There are a wide variety of fishes suitable for farming. Thus, the owners of the fisheries can select the best kind of fish that will be profitable for them. People can transform any poor and infertile piece of land into a fish pond and earn money. To overcome from disadvantages of composite fish culture farming hormonal stimulation is used.

Answer the following questions:

(a) How are fish obtained?

(b) Write any two advantages of composite fish culture.

(c) What is the disadvantage composite fish culture?　　　　　　　　　(1+2+1=4)

Q.39 Aditya started driving his car. He increases the speed till 4 seconds and then he kept his car in constant speed for 6 seconds. Then after he decreased the speed of the car upto another 6 seconds. After reaching at the starting place, he draws the speed-time graph of his 16 seconds driving as shown below:
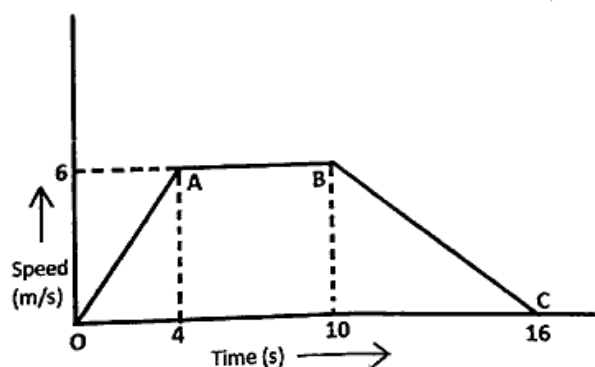
(a) What type of motion is represented by OA ?

(b) Find out the acceleration of the body.

(c) Find out the distance travelled by the body from A to B

(d) What type of motion is represented by BC ?　　　　　　　　　(4)

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