DEHRADUN PUBLIC SCHOOL
ASSIGNMENT (2023-24)
SUBJECT – SCIENCE (086)
CLASS - IX

Chapter-1(Matter in Our Surrounding/Matter – Nature and Behaviour)

Objective Type Questions

Q1. The solid which undergoes sublimation is_____.
a. Ice cube
b. Naphthalene
c. Sodium chloride
d. Potassium chloride

Q2. During summer, water kept in an earthen pot becomes cool because of the phenomenon of
a. Diffusion
b. Transpiration
c. Osmosis
d. Evaporation

Q3. On converting 25°C, 38°C and 66°C to Kelvin scale, the correct sequence of temperature will be
a. 298 K, 311 K and 339 K
b. 298 K, 300 K and 338 K
c. 273 K, 278 K and 543 K
d. 298 K, 310 K and 338 K

Q4. Out of the following, an example of matter which can be termed as fluid is
a. Carbon
b. Sulphur
c. Oxygen
d. Phosphorus

Q5. If the temperature of an object is 268K , it will be equivalent to
a. -5°C b. +5°C c. 368°C d. -25°C

Q6. Assertion(A): The solids do not diffuse in air.
Reason(R): The particles are loosely packed in solids.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): Sugar and salt both are easily dissolved in water.
Reason(R): Sugar and salt are solid hence it is easily dissolved in water.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): Particles in liquid state shows motion.
Reason(R): It possesses kinetic energy.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. Name the process which occurs when a drop of dettol is added to water.

Q10. Name the state of matter in which -
i. layers of particles can slip and slide over one another easily.
ii. particles just move around randomly because of very weak force of attraction.

Q11. Why do gases exert more pressure on the walls of the container than the solids?

Q12. Why do we see water droplets on the outer surface of a glass containing ice cold water?

Q13. Why are gases compressible but not liquids?

Q14. Explain why:

i. Air is used to inflate tyres.

ii. Steel is used to make railway lines.

Q15. Why does our palm feel cold when we put some acetone or perfume on it?

Long Answer Type Questions

Q16. Differentiate between boiling and evaporation.

Q17. Explain evaporation and its cooling effect in terms of kinetic energy of particles.

Q18. Why does the temperature of a substance remain constant during its melting point or boiling point?

Q19. With proper explanation, explain whether the following statements are true or false.

i. Sublimation occurs only when the solid is heated.

ii. A lighter gas can move downwards and a heavier gas can move upwards.

iii. Interconversion of matter is a constant temperature process.

Q20. Classify the following into osmosis/diffusion.

i. Swelling up of a raisin on keeping in water.

ii. Spreading of virus on sneezing.

iii. Shrinking of grapes kept in thick sugar syrup.

iv. Preserving pickles in salts.

Case-based Type Question:

Q21. A matter is anything that has mass and occupies space. Pen, paper, clips, sand etc. are different forms of matter. Every matter is made up of small particles. These particles are so tiny that they cannot be seen with naked eyes. There are three states of matter solid, liquid and gas. Solids have a definite shape, distinct boundaries and fixed volumes. Solids may break under force but it is difficult to change their shape, so they are rigid. Liquids have no fixed shape but a fixed volume. Liquids flow and can change shape, so they are not rigid. Gas has indefinite shape and no fixed volume.

Read the passage carefully and answer the following questions:

i. What is the general name of rigid form of matter?

ii. In which case the compressibility is least?

iii. Write four examples of matter.

OR

Write any four properties of solid.

Chapter -2 (Nature of Matter)

Objective Type Questions

Q1. Which of the following properties does not describe a compound?

a. It is composed of two or more elements

b. It is a pure substance

c. It cannot be separated into constituents by physical means

d. It is mixed in any proportion by mass

Q2. In the tincture of iodine, find the solute and solvent?

a. Alcohol is the solute and iodine is the solvent

b. Iodine is the solute and alcohol is the solvent

c. Any component can be considered as solute or solvent

d. Tincture of iodine is not a solution

Q3. An example of liquid metal and liquid non metal is

a. Gallium, mercury

b. Mercury, chlorine

c. Mercury, bromine

d. Bromine, sulphur

Q4. Which of the following is not an element?

a. Graphite b. Germanium

c. Silica d. Silicon

Q5. One of the following represents the solution of solid in a solid. This one is

a. Boron b. Brass

c. Beryllium d. Bread

Q6. Assertion(A): Sodium chloride is always existed in mixture form.
Reason(R): Substance which made up of more than one constituent called mixture.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A):The Tyndall effect can be observed when sunlight passes through the canopy of dense forest.
Reason(R): Scattering of light by the particles of dust and smoke in the air cause Tyndall effect.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): The particles of a suspension can be seen by the naked eye.
Reason(R): Suspension is a heterogeneous mixture.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. How can you change a saturated solution to an unsaturated solution without adding any more solvent to it?

Q10. Why is water called universal solvent?

Q11. An unknown substance 'A' on thermal decomposition produces 'B' and 'C'. What is 'A'—an element, a compound or a mixture?

Q12. Why is it not possible to distinguish particles of a solute from the solvent in solution?

Q13. Explain why particles of a colloidal solution do not settle down when left undisturbed, while in the case of a suspension they do.

Q14. Name two solid, two liquid and two gaseous elements at the room temperature.

Q15. How will you differentiate between a suspension and a colloid?

Long Answer Type Questions

Q16. Differentiate between -

i. Physical change and chemical change

ii. Saturated and unsaturated solution

Q17. Define emulsion and gel. Give two examples of each.

Q18. Why the inter-conversion of states of matter is considered as a physical change? Give two reasons to justify your answer.

Q19. Explain why, air is considered a mixture and not a compound.

Q20. i . Differentiate between homogeneous and heterogeneous mixtures with examples.

ii. Differentiate between an element and a compound. Write two examples of each.

Case-based Type Question:

Q21. The purest form of matter is called an element. A pure substance consists of a single type of particles. All the elements and compounds are pure substances because they contain only one kindof particles eg. hydrogen, oxygen etc. A homogeneous mixture of two or more substances called a true solution. It consists of solute and solvent.

The particle size of true solution is less than 1 nm. Suspension is a heterogeneous mixture in which the solute particle does not dissolve but remains suspended throughout the bulk of the medium. Colloid is a mixture that is actually heterogeneous but appears to be homogeneous as the particle are uniformly spread throughout the solution.

Read the passage carefully and answer the following questions:

i. Give two examples of pure substance.

ii. Which is more stable true solution or suspension or colloidal solution?

iii. Why is sugar is called pure substance?

OR

How would you confirm that a colourless liquid given to you is pure water?

Chapter-3 (Particle Nature and their Basic Units)

Objective Type Questions

Q1. Which of the following represents 12 u?

a. Mass of 1 hydrogen atom
b. Mass of C-12 atom
c. Mass of O-16 atom
d. 1/12th of mass of C-12 atom.

Q2. The chemical symbol for nitrogen gas is

a. Ni
b. N_2
c. N^+
d. N

Q3. A box contains some identical red coloured balls labelled as A each weighing 2 g. Another box contains identical blue coloured balls, labelled as B, each weighing 5 g. In the combinations AB, AB_2, A_2B and A_2B_3 which is applicable?

a. Law of definite proportion
b. Law of multiple proportion
c. Law of conservation of mass
d. None of the above

Q4. The atomicities of ozone, sulphur, phosphorus and argon are respectively

a. 8, 3, 4 and 1
b.1, 3, 4 and 8
c. 4, 1, 8 and 3
d. 3, 8, 4 and 1

Q5. In water, the proportion of oxygen and hydrogen by mass is

a. 1 : 4
b. 1 : 8
c. 4 : 1
d. 8 : 1

Q6. Assertion(A): Ions are always positively charged.
Reason(R): Ions are formed by losing or gaining of electrons.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): N_2 and H_2O are molecules.
Reason(R): A molecule can have only similar kind of atoms.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): The valency of aluminium is 3 and oxygen is 2.

Reason(R): The chemical formula of aluminium oxide is Al_2O_3.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. Write any four postulates of Dalton's atomic theory.

Q10. Write the chemical formulae for the following.

i. Calcium oxide ii. Sodium nitrate

Q11. Define atomicity. Write the atomicity of the sulphur and phosphorus molecules.

Q12. The atomic number of three elements A, B and C are 9, 10 and 13 respectively. Which of them will form a cation?

Q13. Calculate the formula unit mass of sodium carbonate (Na_2CO_3).

Q14. Explain the difference between 2N and N_2.

Q15. An element B shows valencies of 4 and 6. Write the formula of its two oxides.

Long Answer Type Questions

Q16. Explain law of conservation of mass.

Q17. Calculate the molecular mass of the following.

i. H_2CO_3 ii. C_2H_5OH iii. $MgSO_4$

Q18. Differentiate between cation and anion.

Q19. Write the formulae for the following and calculate the molecular mass for each one of them.

i. Quick lime ii. Baking powder
iii. Calcium carbonate iv. Potassium sulphate
v. Hydrogen bromide vi. Common salt

Q20. Explain law of constant proportion with the help of an example.

Case-based Type Question:

Q21. The molecular mass of a substance is the sum of the atomic masses of all the atoms in a molecule of the substance. It is therefore, the relative mass of a molecule expressed in atomic mass unit (u). Depending upon the number of atoms of same or different elements present in the molecule, it can be monoatomic, diatomic, triatomic, tetra-atomic or polyatomic molecule.

The formula unit mass is calculated in the same manner as the molecular mass calculated. It is a sum of the atomic masses of all atoms in a formula unit of compound.

Read the passage carefully and answer the following questions:

i. Write an example of polyatomic molecule.
ii. What is the relative molecular mass of H_2O?
iii. What is the formula unit mass of $CaCl_2$ and HNO_3?

Chapter-4 (Structure of Atoms)

Objective Type Questions

Q1. Which of the following correctly represents the electronic distribution in the Mg atom?

a. 3, 8, 1 b. 2, 8, 2
c. 1, 8, 3 d. 8, 2, 2

Q2. Rutherford's 'alpha (α) particles scattering experiment' resulted in the discovery of

a. Electron b. Proton
c. Nucleus in the atom d. Atomic mass

Q3. Which of the following statement is always correct?

a. An atom has equal number of electrons and protons.

b. An atom has equal number of electrons and neutrons.
c. An atom has equal number of protons and neutrons.
d. An atom has equal number of electrons, protons and neutrons.

Q4. The first modal of an atom was given by
a. Neils Bohr
b. Ernest Rutherford
c. J.J. Thomson
d. E. Goldstein

Q5. For an element, Z=9. The valency of this elements will be
a. 4
b. 2
c. 1
d. 3

Q6. Assertion(A): Atom is electrically neutral.
Reason(R): A neutral particle, neutron is present in the nucleus of atom.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): Atomic mass of aluminum is 27.
Reason(R): An atom of aluminum is 27 times heavier than 1/12th of the mass of the carbon-12 atom.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): Isobars possess the same number of protons.
Reason(R): Isotopes of chlorine occur in the ratio 1:4.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. Why noble gases show least reactivity?

Q10. Write the electronic configuration of the elements whose atomic numbers are 7, 17 and 19.

Q11. What are isotopes? Write two applications of isotopes.

Q12. What is the similarity in the electronic structure of lithium, sodium and potassium?

Q13. Show diagrammatically the electron distribution in a sodium atom and a sodium ion and also give their atomic number.

Q14. Compare an electron, a proton and a neutron in respect of their relative mass and charge.

Q15. Describe Thomson's model of the atom.

Long Answer Type Questions

Q16. Calculate the atomic number of element whose atomic nucleus has mass number 23 and neutron number 12. What is the symbol for this element?

Q17. One electron is present in the outermost shell of the atom of an element 'Z'.
i. What will be the nature of this element?
ii. What will be the value of charge on the ion formed, if this electron is removed from the outermost shell?

Q18. Write postulates of Bohr's model of an atom.

Q19. The number of protons, neutrons and electrons in particles from A to E are given below.

Particle	Protons	Neutrons	Electrons
A	17	18	17
B	3	4	2
C	18	22	18
D	17	20	17
E	9	10	10

i. Which one is a cation?
ii. Which one is an anion?
iii. Which represent pair of isotopes?

Q20. Give reasons.
i. Atom is electrically neutral.
ii. Atom as a whole is an empty space.
iii. Rutherford model of atom could not provide stability to the nucleus.

Case-based Type Question:

Q21. Protons are present in the nucleus of an atom. The mass of an atom is practically due to protons and neutrons alone. The knowledge of valencies of various radicals helps us to write the formulae of chemical compounds. The total positive charge on positive ions is equal to the total negative charge on negative ions in a molecule. Therefore, in writing the formula of a compound, the positive and negative ions are adjusted in such a way that the total number of positive charges of positive ions becomes equal to the total number of negative charges of negative ions.
There is another simple method for writing the formulae of ionic compounds. In this method, the valencies (positive or negative charges) of the ions can be 'crossed over' to give subscripts.
Read the passage carefully and answer the following questions:

i. An element X has two valencies 3 and 5. Work out the formulae of two oxides of this element.

ii. Work out the formula for sulphur dioxide.

iii. The formula of a compound is X_3Y. what will be the valencies of elements X and Y ?

Chapter-5 (Cell-Basic Unit of Life)

Objective Type Questions

Q1. Which plastids are colourless?
a. Chromoplast
b. Leucoplast
c. Chloroplast
d. None of these

Q2. Where are the essential proteins and lipids required for cell membrane, manufactured?
a. Endoplasmic Reticulum
b. Plastids
c. Mitochondria
d. Vacuoles

Q3. Chromosomes are made up of
a. DNA
b. Protein
c. DNA and protein
d. RNA

Q4. Which of the following are covered by a single membrane?
a. Mitochondria
b. Vacuole
c. Lysosome
d. Plastid

Q5. Living cells were discovered by
a. Robert Hooke
b. Purkinje
c. Leeuwenhoek
d. Robert Brown

Q6. Assertion(A): All plants and animals are composed of cells.
Reason(R): Plants and animals made up of DNA.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): Lysosomes are called as suicidal bags of the cell.
Reason(R): Lysosomes provide turgidity and rigidity to the cell.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): Chloroplast is called the kitchen of the cell.
Reason(R): Chlorophyll pigment is present in chloroplast which helps in photosynthesis.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. Why does the skin of your finger shrink when you wash clothes for a long time?

Q10. If the organisation of a cell is destroyed due to some physical or chemical influence, what will happen?

Q11. Why do plant cells possess large-sized vacuole?

Q12. Endocytosis is found in animals only. Justify.

Q13. Do you agree that "A cell is the building unit of an organism". If yes, explain why?

Q14. Why are lysosomes also known as "Scavengers of the cells"?

Q15. List any three functions of performed by endoplasmic reticulum.

Long Answer Type Questions

Q16. Grass looks green, papaya appears yellow. Which cell organelle is responsible for this? Explain about it.

Q17. In brief state what happens when
i. dry apricots are left for sometime in pure water and later transferred to sugar solution?
ii. a red blood cell is kept in concentrated salt solution?
iii. the plasma membrane of a cell breaks down.

Q18. Draw a plant cell and label the parts which
i. determines the function and development of the cell.
ii. packages materials coming from the endoplasmic reticulum.
iii. provides resistance to microbes to withstand hypotonic external media without bursting.

Q19. A person takes concentrated solution of salt, after sometime, he starts vomiting. What is the phenomenon responsible for such situation? Explain.

Q20. Differentiate between rough and smooth endoplasmic reticulum. How is endoplasmic reticulum important for membrane biogenesis?

Case-based Type Question:

Q21. Every cell has a membrane around it keep its own contents separate from the external environment. Large and complex cells need a lot of chemical activities to support their structure and function. To keep these activities of different kinds separate from each other, these cells use membrane bound structures within themselves. This is one of the features of the eukaryotic cells that distinguish them from prokaryotic cells.

Read the passage carefully and answer the following questions:

i. Are ribosomes the center of protein synthesis?
ii. What is involved in the synthesis and transport of proteins?
iii. What are 4 examples of membrane bound organelles?

Chapter-6 (Tissues)

Objective Type Questions

Q1. Which of the following is connective tissue?
a. Ligament b. Tendon
c. Blood d. All of these

Q2. Rapid elongation of a bamboo stem is due to
a. Lateral meristem b. Intercalary meristem
c. Apical meristem d. Cambium

Q3. Meristematic tissues in plants are
a. Localised and permanent b. Not limited to certain regions
c. Localised and dividing cells d. Growing in volume

Q4. Flexibility in plants is due to
a. Collenchyma b. Sclerenchyma
c. Parenchyma d. Chlorenchyma

Q5. Nervous tissue is not found in
a. Brain b. Spinal cord
c. Tendons d. Nerves

Q6. Assertion(A): Apical meristem is present at the growing tips of stems and roots.
Reason(R): Apical meristem is always located upper side of plant.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): Blood is a fluid connective tissue.
Reason(R): It is a motile connective tissue which connects all the tissues, organs with each other.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A):Axon and dendrites are special features of neurons.
Reason(R): They help in the rapid conduction of nerve impulses.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. Differentiate the following activities on the basis of voluntary (V) or involuntary (IV) muscles.
i. Jumping of frog ii. Pumping of the heart iii. Writing with hand

Q10. Water hyacinth floats on water surface. Explain.

Q11. Why is epidermis is important for the plants?

Q12. A person met with an accident in which two long bones of hand were dislocated. What could be the possible reason?

Q13. Why is epidermis present as a thick waxy coating of cutin in desert plants?

Q14. Give two major differences between parenchyma and collenchyma.

Q15. What is cartilage? How is it different from a bone?

Long Answer Type Questions

Q16. Why are plants and animals made up of different types of tissue?

Q17. Draw and label different elements of phloem.

Q18. Give reasons.

i. Meristematic cells have a prominent nucleus and dense cytoplasm but they lack vacuoles.
ii. Intercellular spaces are absent in sclerenchymatous tissues.
iii. We get a crunchy and granular feeling when we chew pear fruit.

Q19. Name the tissue and write characteristic feature of following

i. Connects bone to bone in humans.
ii. Forms inner lining of alveoli.
iii. Transports water and minerals, in plants

Q20. Explain the significance of the following.

i. Hair like structures on epidermal cell.
ii. Small pores in epidermis of leaf.
iii. Numerous layers of epidermis in cactus.

Case-based Type Question:

Q21. On the basis of dividing capacity, plant tissues can be classified into two fundamental types namely meristematic tissues and permanent tissues. In meristematic tissues, cells are capable of division. In permanent tissues, mature cells are not capable of cell division.

Read the passage carefully and answer the following questions:

i. Which tissue has dead cells?
ii. What will happen if apical meristem of sugarcane is damaged?
iii. Name the types of meristematic tissues.

Chapter -7 (Motion)

Objective Type Questions

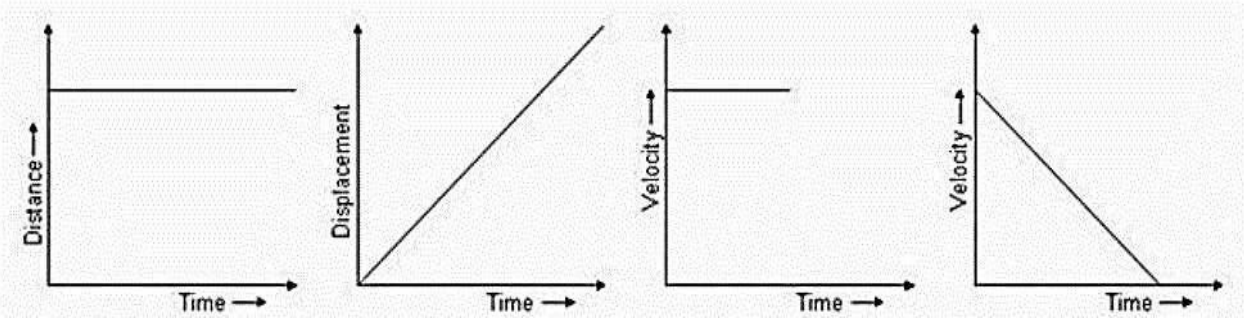
Q1. Which of the following statements is correct?

a. Both speed and velocity are same
b. Speed is scalar and velocity is vector quantity
c. Speed is vector and velocity is scalar quantity
d. None of these

Q2. What is the slope of the body when it moves with uniform velocity?

a. Positive
b. Negative
c. Zero
d. May be positive or negative

Q3. Which of the following graphs shows that the body is at rest?



a. b. c. d.

Q4. If the displacement of an object is proportional to square of time, then the object moves with

a. Uniform velocity
b. Uniform acceleration
c. Increasing acceleration
d. Decreasing acceleration

Q5. Slope of velocity- time graph gives

a. The distance
b. The displacement

c. The acceleration d. The speed

Q6. Assertion(A): The displacement of an object can be either positive, negative or zero.
Reason(R): Displacement has both the magnitude and direction.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): An object may acquire acceleration even if it is moving at a constant speed.
Reason(R): With change in the direction of motion, an object can acquire acceleration.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): Velocity versus time graph of a particle in uniform motion along a straight path is a line parallel to the time axis.
Reason(R): In uniform motion, the velocity of a particle increases as the square of the time elapsed.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answers Type Questions

Q9. Under what condition(s) is the magnitude of average velocity of an object equal to its average speed?

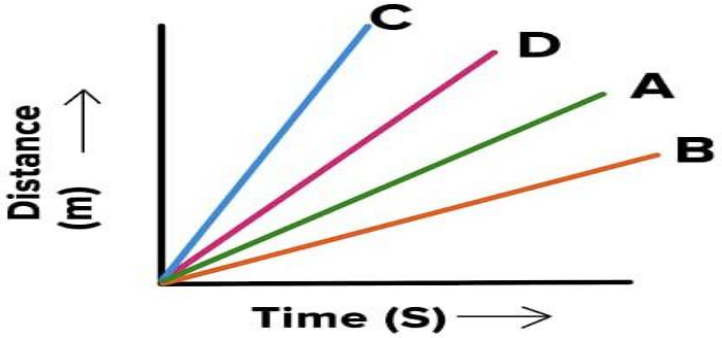
Q10. During an experiment, a signal from a spaceship reached the ground station in five minutes. What was the distance of the spaceship from the ground station? The signal travels at the speed of light, that is, $3 \times 10^8 ms^{-1}$.

Q11. When will you say a body is in

i. uniform acceleration. ii. non-uniform acceleration.

Q12. A trolley, while going down an inclined plane, has an acceleration of 2 cm s^{-2}. What will be its velocity 3 s after the start?

Q13. Four cars A, B, C and D are moving on a levelled road. Their distance versus time graph is shown in the adjacent figure. Choose the correct statement.



i. Which car is fastest?
ii. Which car is slowest?

Q14. Distinguish between speed and velocity.

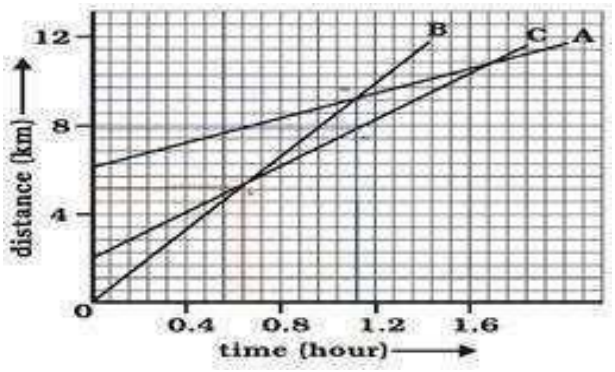
Q15. A bus decrease its speed from 72 km/h to 54 km/h in 10 sec. Calculate the acceleration of the bus.

Long Answer Type Questions

Q16. A farmer moves along the boundary of a field of side 10 m in 40 sec. What will be the magnitude of displacement of the farmer at the end of 2 minutes 20 seconds from his initial position?

Q17. An athlete completes one round of a circular track of diameter 200 m in 40 s. What will be the distance covered and the displacement at the end of 2 minutes 20 s?

Q18. Following distance-time graph of three objects A, B and C. Study the graph and answer the following questions.



i. Which of the three is travelling the fastest?
ii. Are all three ever at the same point on the road?
iii. How far has C travelled when B passes A?
iv. How far has B travelled by the time it passes C?

Q19. State which of the following situations are possible and give an example for each of these
i. An object with a constant acceleration but with zero velocity.
ii. An object moving with an acceleration but with uniform speed.
iii. An object moving in a certain direction with an acceleration in the perpendicular direction.

Q20. Answer the following:
i. A racing car has a uniform acceleration of $4 m/s^2$. What distance will it cover10s after the start?
ii. A stone is thrown in a vertically upward direction with a velocity of $5ms^{-1}$**.** If the acceleration of the stone during its motion is 10 m s^{-2} in the downward direction, what will be the height attained by the stone and how much time will it take to reach there?

Case-based Type Question:

Q21. When an object moves in a circular path with uniform speed, its motion is called uniform circular motion. The direction of motion changed at every point moving along the circular path. Read the passage carefully and answer the following questions:
i. A particle is moving in a circular path of radius r. What is the displacement after half a circle?
ii. Why is the work done on an object moving with uniform circular motion zero?
iii. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 meters, calculate his speed.

Chapter – 8 (Force and Newton's Law)

Objective Type Questions

Q1. In the following diagram the direction of the boat will be

a. Move away from the shore
b. Move towards the shore
c. Remains stationary
d. None of these

Q2. If the force acting on the body is zero. Its momentum is
a. Zero
b. Constant
c. Both a and b
d. None of these

Q3. The people in the bus are pushed backwards when the bus starts suddenly due to
a. Inertia due to rest
b. Inertia due to motion
c. Inertia due to direction
d. Inertia

Q4. According to third law of motion, action and reaction
a. Always act on the same body
b. Have same magnitude and directions
c. Always act on different bodies in opposite direction
d. Act on either body at normal to each other

Q5. Which of the following SI unit of force?
a. Kgm/s
b. Kg-m/s^{-1}
c. Newton- metre
d. Newton

Q6. Assertion(A): From Newton's second law of motion, impulse is equal to change in momentum.
Reason(R): Impulse and momentum have different SI units.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. Both Assertion and Reason are false.

Q7. Assertion(A): When a firefly hits a bus, each of them exerts the same force.
Reason(R): Firefly has more mass as compared to the wind shield.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): While walking on ice, one should take small steps to avoid slipping.
Reason(R): This is because smaller steps ensure smaller friction.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true

Short Answer Type Questions

Q9. A body of mass 5 kg starts and rolls down 32 m of an inclined plane in 4 s. Find the force acting on the body.

Q10. Explain why some of the leaves may get detached from a tree if we vigorously shake its branch.

Q11. A boy throws a stone upward with a velocity of 60 m/s. (g = -10 m/s^2)
i. How long will it take to reach the maximum height?
ii. What will be the maximum height reached by the stone?
iii. How long will it take to reach the ground?

Q12. Calculate the momentum of a toy car of mass 300 kg moving with a speed of 18 km/h.

Q13. A cricket player lowers his hand while catching a fast moving cricket ball. Explain why?

Q14. Why do the passengers in a bus tend to fall backward, when it is starts suddenly?

Q15. A ball is thrown vertically upwards. What is its momentum at the highest point?

Long Answer Type Questions

Q16. State Newton second law's of motion and establish that F =ma, where symbols have their usual meanings.

Q17. What would be the force required to stop a car of mass 1000 kg and a loaded truck of mass 10000 kg in 2 seconds, if they are moving with same velocity of 5m/s^2.

Q18. A force of 2 N gives a mass m_1 an acceleration of 5 m/s^2 and a mass m_2 an acceleration of $7m/s^2$. What acceleration would be produced if both the masses are tied together?

Q19. i. When a motorcar makes a sharp turn at a high speed, we tend to get thrown to one side. Why?

ii. State Newton's first and third law of motion.

iii. A force of 5 N gives a body of mass 'm' an acceleration of $10m/s^2$, calculate the mass of the body in grams.

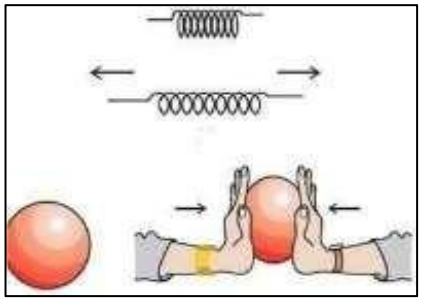
Q20. Using second law of motion, derive the relation between force and acceleration. A bullet of mass 10 g strikes a sand bag with a velocity of 10^3 ms^{-1} and gets embedded after travelling 5 cm. Calculate

i. the resistive force exerted by the sand bag on the bullet.

ii. the time taken by the bullet to come to rest

Case-based Type Question:

Q21. 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.



Read the passage carefully and answer the following questions:

i. Which law of motion is involved in the recoil of gun?

ii. What are two opposite forces called?

iii. What is the acceleration produced by a force of 5 N acting on a mass of 20 kg ?

OR

Write one application Newton's third law of motion.

Chapter – 9 (Gravitation and floatation)

Objective Type Questions

Q1. If the distance between two objects is doubled, the gravitational force between them

a. Remains the same
b. Gets doubled
c. Becomes one fourth
d. Gets halved

Q2. A stone is dropped from a cliff. Its speed after it has fallen 100 m is

a. 98 ms^{-1}
b. 19.69 ms^{-1}
c. 9.8 ms^{-1}
d. 44.2 ms^{-1}

Q3. Which of the following is an application of Earth's gravitation?

A. It holds atmosphere around our globe
B. It holds us firmly on the surface of the Earth
C. It is responsible for motion of moon
D. It is responsible for sea tides due to the moon

a. A and B
b. A, B and D
c. All of these
d. A and C

Q4. The atmosphere is held to the earth by

a. Gravity b. Wind

c. Clouds d. Earth' magnetic field

Q5. The weight of an object at the centre of the earth of radius R is

a. $1/R^2$ time the weight at the surface of the earth b. Infinite

c. R times the weight at the surface of the earth d. zero

Q6. Assertion(A): Universal gravitational constant G is a scalar quantity.

Reason(R): The value of G is same through out the universe.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Q7. Assertion(A): When distance between two bodies is doubled and also mass of each body is doubled, then the gravitational force between them remains the same.

Reason(R): According to Newton's law of gravitation, the force between two objects is directly proportional to the product of their masses.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Q8. Assertion(A): The value of acceleration due to gravity changes with the height, depth and shape of the earth.

Reason(R): Acceleration due to gravity is zero at the centre of the earth.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. What do you mean by buoyancy?

Q10. What is the acceleration of free fall?

Q11. The earth and the moon are attracted to each other by gravitational force. Does the earth attract the moon with a force that is greater or smaller or the same as the force with which the moon attracts the earth? Why?

Q12. Why does a block of plastic released under water come up to the surface of water?

Q13. What are fluids? What are the factors on which the upward pressure at a point on a fluid depends?

Q14. What do you mean by acceleration due to gravity?

Q15. A stone is released from the top of the tower of height 19.6 m. Calculate its final velocity just before touching the ground.

Long Answer Type Questions

Q16. If the mass of one object is doubled and mass of other remains the same and if distance between them is halved then how does the gravitational force change?

Q17. The radius of the earth is about 6370 km. An object of mass 30 kg is taken to a height of 230 km above the surface of earth.

i. What is the mass of the body?

ii. What is the acceleration due to gravity at this height?

iii. What is the weight of the body at this height?

Q18. i. A sharp knife is more effective than a blunt knife. Why?

ii. Why is easier to swim in sea water than freshwater?

Q19. State universal law of gravitation. Write SI unit of G. The gravitational force between two objects is 100 N. How should the distance between the objects be changed so that force between them becomes 50 N?

Q20. A man of mass 60 kg is standing on the floor holding a stone weighing 40 N. What is the force with which the floor is pushing him up?

Case-based Type Question:

Q21. Archimedes' Principle: Whenever an object is immersed partly or completely in a fluid, the fluid exerts an upwards force on it. The upwards force acting on the immersed object is called buoyant force or upthrust. A Greek scientist Archimedes' experimentally measured the magnitude of buoyant force and on the basis of his experimental results he obtained a principle which is known as Archimedes' principle. As per this principle whenever an object is immersed in a fluid, it experiences a buoyant force whose magnitude is equal to weight of the fluid displaced by the immersed part of object.

Read the passage carefully and answer the following questions:

i. What is the SI unit of upthrust force?
ii. In which direction does the buoyant force acts on an object due to a liquid act?
iii. State the principle which is used in designing of Ships and submarines.

Chapter-10 (Work, Energy and Power)

Objective Type Questions

Q1. A man do work of 730J in 20 seconds. Calculate power delivered by the man.

a. 35.5 watt b. 36.5 watt
c. 37.5 watt d. 38.5 watt

Q2. P. E. of your body is maximum when you

a. are standing b. are sitting on the chair
c. are sitting on the ground d. lie down on the ground

Q3. Which of the following quantities have same units?

a. Power and energy b. Power and work
c. Work and energy d. None of the above

Q4. When a body falls freely towards the Earth, then its total energy

a. Increase b. Decrease
c. remain constant d. First increase then increase

Q5. The work done on an object does not depend upon the

a. Displacement b. Force applied
c. Angle between force and displacement d. Initial velocity of the object

Q6. Assertion(A): The work done during a round trip is not zero.
Reason(R): No force is required to move a body in its round trip.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): A winded toy car, when placed on floor, starts moving.
Reason(R): Toy car has kinetic energy stored in it which facilitates its motion.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): A spring has potential energy, both when it is compressed or stretched.
Reason(R): In compressing or stretching, work is done on the spring against the restoring force.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. An object of mass 10 kg is at a point A on a table. It is moved to a point B. If the line joining A and B is horizontal, what is the work done on the object by the gravitational force? Explain your answer.

Q10. If a 100 J of work was done, when a force of 12.5 N acts, what was the distance moved by the force?

Q11. A man of mass 50 kg runs up a flight of stairs having a rise of 5 m is 4 s.

i. What is the work done by the man?
ii. What is the average power developed by the man?

Q12. If the heart works 60 joules in one minute, what is its power?

Q13. The potential energy of a freely falling object decreases progressively. Does this violate the law of conservation of energy ? Why?

Q14. What is the kinetic energy of an object?

Q15. What is the power? Write its SI unit.

Long Answer Type Questions

Q16. Derive an expression for the kinetic energy of the body. Calculate the kinetic energy for a body of mass 5 kg moving with a velocity 2.5 m/s^2.

Q17. What is power? Show that Power=Force x Velocity. Calculate power of a body of mass 10 kg accelerating with 10 m/s^2 acquires a velocity of 5 m/s .

Q18. A body of mass 5 kg is lifted vertically at a constant velocity of 12m. Calculate

i. the force applied.
ii. work done in lifting the body.

Q19. i. Define potential energy. Write an expression for potential energy of an object of mass m raised through a height h.

ii. Find the energy possessed by an object of mass 10 kg when it is raised to a height of six metre above the ground.(Given g = 9.8m/s^2)

Q20. The velocity of a body moving in a straight line is increased by applying a constant force F, for some distance in the direction of the motion. Prove that the increase in the kinetic energy of the body is equal to the work done by the force on the body.

Case-based Type Question:

Q21. Mechanical Work: The term work is commonly used in our day-to-day life. However, there is a difference in the way we use the term work in day-to-day life and the way we use it in science. Let Smita be preparing for her board examination. She spends a lot of time in studies. She reads books, prepares notes, solves the problems, attends her classes and performs experiments etc. In common parlance she is working hard but by the scientific definition of work she is doing either no or a very little work.

In science work is said to be done when a force acting on an object actually displaces the object in the direction of force applied. Work done (W) by a force (F) acting on an object is equal to the magnitude of the force multiplied by the distance (s) moved in the direction of force.

Mathematically, Work done (W)= Force (F) x distance moved in the direction of force(s).

Read the passage carefully and answer the following questions:

i. What is SI unit of mechanical work?
ii. Define positive work done.
iii. A pair of bullocks exerts a force of 140 N on a ploughed is 15m long. How much work is done in ploughing the length oh the field?

OR

What would be the work done if
i. force on the object is zero?
ii. displacement of the object is zero?

Chapter-11 (Sound)

Objective Type Questions

Q1. The frequency of a visible light of wavelength 600 nm is (speed of light = 3×10^8 m/s),

($1nm = 10^{-9}$ m)

a. 50 Hz
b. 5×10^{14} Hz
c. 0.5×10^{16} Hz
d. 500 Hz

Q2. Stethoscope work on the principle of

a. Multiple reflection of sound
b. Ultrasound
c. Both a and b
d. None of the above

Q3. Frequency of ultrasonic sound wave is

a. Greater than 20 Hz
b. Greater than 20,000 Hz
c. Greater than 2 Hz
d. Greater than 2 MHz

Q4. When we change feeble sound to loud sound we increase its

a. Frequency
b. Amplitude
c. Velocity
d. Wavelength

Q5. Infrasound can be heard by

a. Dog
b. Bat
c. Rhinoceros
d. Human beings

Q6. Assertion(A): The sound of the human voice is produced due to vibrations in the vocal cords.
Reason(R): Vibrations means a kind of rapid to and fro motion of an object.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q7. Assertion(A): With decrease in time period, frequency increases.
Reason(R): Time period and frequency are inversely proportional.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q8. Assertion(A): The particles do not travel all the way from the vibrating object to the ear.
Reason(R): A particle of the medium in contact with the vibrating object is first displaced from its equilibrium position.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. What is the range of frequencies associated with

i. Infrasound ii. Ultrasound

Q10. Define

i. Time Period ii. Amplitude of a wave

Q11. An under water device directs ultrasounds of frequency 75 kHz towards water surface. What is the wavelength of sound in the air above the water surface and what is its frequency? Speed of sound in air = 340 m/s.

Q12. Flash and thunder are produced simultaneously. But thunder is heard a few seconds after the flash is seen, why?

Q13. How can ultrasound be used to detect the defect in metal block?

Q14. Find the frequency of a wave whose time period is 0.002 second.

Q15. What is sound and how is it produced?

Long Answer Type Questions

Q16. When a sound is reflected from a distant object, an echo is produced. Let the distance between the reflecting surface and the source of sound production remain the same. Do you hear echo sound on a hotter day?

Q17. A cork on the surface of water moves up and down completing five vibrations in 4 s. The waves travels from a cork to the shore which is 20 m away in 10 s. Calculate

i. Speed
ii. Frequency
iii. Wavelength

Q18. Write an expression relating wave velocity, wavelength and frequency if speed of sound in air is 340 m/s^2. Calculate

i. Wavwlength when frequency = 256Hz.
ii. Frequency when wavelength = 0.85m.

Q19. What is ultrasound? Describe its two practical applications.

Q20. i. Draw a diagram depicting soft sound and a loud sound. What is the main difference between the two?

ii. Why are ceilings of concert halls and conference halls made curved? Explain with a diagram.

iii. Can two astronauts talk on the surface of the moon as they do on the surface of the earth? Why?

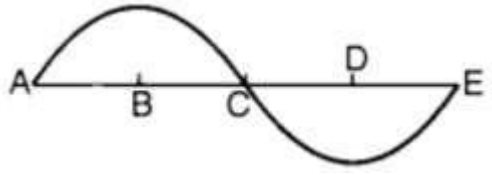
Case-based Type Question:

Q21. Loudness and Intensity of sound: It is our common experience that if one beats the membrane of a drum, using a drum stick, gently then a soft sound is produced. However, if the person starts beating at a harder pace, then a loud sound is produced. The loudness of a sound is its characteristic due to which we are able to distinguish between a loud sound and a soft sound. The loudness of a sound mainly depends on the amplitude of vibrations. It also depends on the distance of the listener from the source of sound.

We sometimes use the terms loudness and intensity interchangeably but they are not the same. Loudness is a measure of the response of the ear to the sound. Thus, loudness is a subjective quantity.

Read the passage carefully and answer the following questions:

i. Dose loudness of a sound depends on the wavelength of sound?
ii. What is the wavelength in the given curve?



iii. Write two difference between loudness and intensity.

OR

Define Intensity of sound..

Chapter-12 (Food Production)

Objective Type Questions

Q1. Which one is an oil yielding plant among the following?

a. Lentil b. Sunflower

c. Cauliflower d. Hibiscus

Q2. Poultry fowl are susceptible to the following pathogens

a. viruses b. bacteria

c. fungi d. all of the above

Q3. Which one of the following nutrients is not available in fertilizers?

a. Nitrogen b. Phosphorus

c. Iron d. Potassium

Q4. Preventive and control measures adopted for the storage of grains include

a. Strict cleaning b. Proper disjoining

c. Fumigation d. all of the above

Q5. Weeds affect the crop plants by

a. Killing of plants in field before they grow

b. Dominating the plants to grow

c. Compare for various resources of crops causing low availability of nutrients.

d. All of above

Q6. Assertion(A): Manure improve soil condition.

Reason(R): In manures, elements are not present in adequate proportions.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Q7. Assertion(A): In spite of large population of cattle, milk production is meagre in India.

Reason (R): Poor quality feed is given to cattle.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Q8. Assertion(A): Pesticides are poisonous for living organisms and cause pollution.

Reason(R): Organic farming is environment friendly and does not rely on chemicals.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Short Answer Type Questions

Q9. Can increasing grain production alone solve the problem of malnutrition and hunger?

Q10 What happens due to deficiency of nutrients?

Q11. Why is excess use of fertilizers detrimental for the environment?

Q12. Why should pesticides be used judiciously?

Q13. Enumerate the advantages of mixed farming.

Q14. What are manure and fertilizer?

Q15 . Why is organic matter important for crop production ?

Long Answer Type Questions

Q16. Enlist the criteria for the selection of crops for mixed cropping.

Q17. Discuss various methods for weed control.

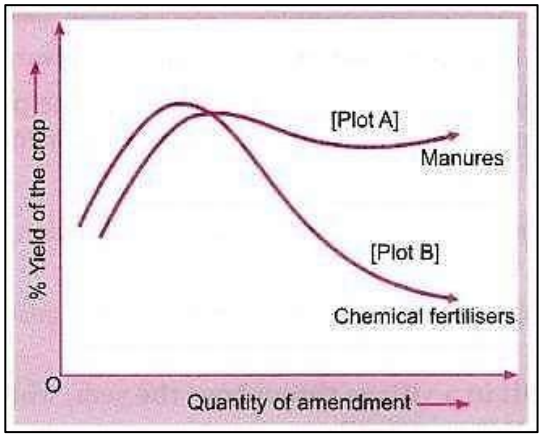
Q18. If there is low rainfall in a village throughout the year, what measures will you suggest to the farmers for better cropping?

Q19. What would happen if poultry birds are larger in size and do not have summer adaptation capacity? In order to get small-sized poultry birds, having summer adaptability, what method will be employed?

Q20. Figure shows the two crop fields [plot A and B] have been treated by manures and chemical fertilizers respectively, keeping other environmental factors same.

Observe the graph and answer the following questions.

i. Why does plot B show sudden increase and then gradual decrease in yield?
ii. Why is the highest peak in plot A graph slightly delayed?
iii. What is the reason for the different pattern of the two graphs?



Case-based Type Question:

Q21. Different crops require different climatic conditions, temperature and photoperiods for their growth and completion of their life cycle. Photoperiods are related to the duration of sunlight.Growth of plants and flowering are dependent on sunlight. Plants manufacture their food in sunlight by the process of photosynthesis.

Read the passage carefully and answer the following questions:

i. What do you mean by Rabi crops?
ii. What do we get from cereals, pulses, fruits and vegetables?
iii. What is crop improvement process?

OR

Name four proteins containing Rabi crops.