

- 3.42 g of sucrose is dissolved in 18 g of water in a beaker. The number of oxygen atoms in the solution is :

(a) 6.68×10^{23}	(b) 6.09×10^{22}
(c) 6.022×10^{23}	(d) 6.22×10^{21}
- Earthquake produces which kind of sound before the main shock wave begins.

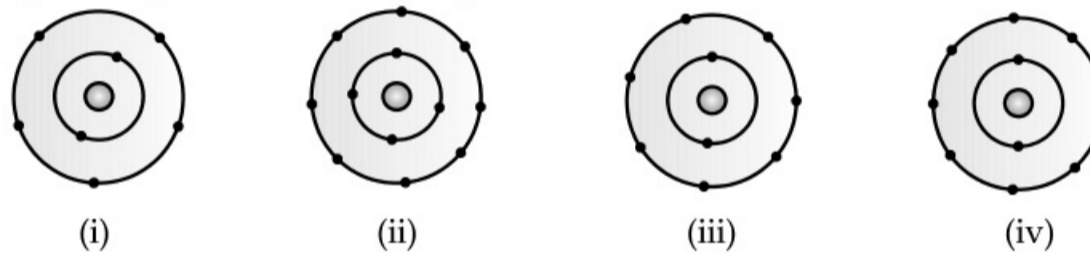
(a) Ultrasound	(b) Infrasound
(c) Audible sound	(d) None of these
- Which of the following are true for an element?

(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	
(a) (i) and (ii)	(b) (i) and (iii)
(c) (ii) and (iii)	(d) (ii) and (iv)



OR

Which of the following in figure do not represent Bohr's model of an atom correctly?



- | | |
|-------------------|--------------------|
| (a) (i) and (ii) | (b) (ii) and (iii) |
| (c) (ii) and (iv) | (d) (i) and (iv) |
- While doing work and running, you move your organs like hands, legs, etc. Which among the following is correct?

(a) Smooth muscles contract and pull the ligament to move the bones
(b) Smooth muscles contract and pull the tendons to move the bones
(c) Skeletal muscles contract and pull the ligament to move the bones
(d) Skeletal muscles contract and pull the tendon to move the bones

OR

A long tree has several branches. The tissue that helps in the sideways conduction of water in the branches is

- | | |
|------------------|----------------------|
| (a) Collenchymas | (b) Xylem parenchyma |
| (c) Parenchyma | (d) Xylem vessels |
- In which of the following conditions, the distance between the molecules of hydrogen gas would increase?

(i) Increasing pressure on hydrogen contained in a closed container.	
(ii) Some hydrogen gas leaking out of the container.	
(iii) Increasing the volume of the container of hydrogen gas.	
(iv) Adding more hydrogen gas to the container without increasing the volume of the container.	
(a) (i) and (ii)	(b) (i) and (iv)
(c) (ii) and (iii)	(d) (ii) and (iv)
 - Two chemical species X and Y combine together to form a product P which contains both X and Y, $X + Y \rightarrow P$, X and Y cannot be broken down into simpler substances by simple chemical reactions. Which of the following concerning the species X, Y and P are correct?

(i) P is a compound	(ii) X and Y are compounds
(iii) X and Y are elements	(iv) P has a fixed composition
(a) (i), (ii) and (iii)	(b) (i), (ii) and (iv)
(c) (ii), (iii) and (iv)	(d) (i), (iii) and (iv)

7. Which of the following is not a criterion for classification of living organisms?
- (a) Body design of the organism
 - (b) Ability to produce one's own food
 - (c) Membrane bound nucleus and cell organelles
 - (d) Height of the plant

OR

Which is not an aquatic animal?

- (a) Hydra
- (b) Jelly fish
- (c) Corals
- (d) Filaria

AI 8. A girl is carrying a school bag of 3 kg mass on her back and moves 200 m on a levelled road. The work done against the gravitational force will be ($g = 10 \text{ ms}^{-2}$)

- (a) $6 \times 10^3 \text{ J}$
- (b) 6 J
- (c) 0.6 J
- (d) Zero

AI 9. Weeds affect the crop plants by

- (a) Killing of plants in field before they grow
- (b) Dominating the plants to grow
- (c) Competing for various resources of crops (plants) causing low availability of nutrients
- (d) All of the above

AI 10. According to the third law of motion, action and reaction

- (a) Always act on the same body
- (b) Always act on different bodies in opposite directions
- (c) Have same magnitude and direction
- (d) Act on either body at normal to each other

11. Name the atmospheric gas that leads to global warming.

12. Give reason, why a block of plastic when released under water comes up to the surface of water.

13. Write the SI unit of weight.

OR

Who formulated the universal law of gravitation ?

14. A substance has a finite volume but not a definite shape. Write the physical state of substance.

OR

Name the phenomenon of changing of a liquid into vapour at a temperature even below its boiling point.

15. What will happen to an element 'Z' if its atoms gain three electrons ?

OR

There are 15 protons and 16 neutrons in the nucleus of an element. Calculate its atomic number and its atomic mass.

DIRECTIONS (Qs. 16 to 20) : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

AI 16. **Assertion:** Elements and compounds are pure substances.

Reason: Properties of compounds are different from those of its constituent elements.

17. **Assertion:** Chloroplast performs photosynthesis.

Reason: Chloroplast comprises photosynthetic pigments.

18. **Assertion:** Tuberculosis is an acute disease.

Reason: Disease that last for a short period is called acute disease.

19. **Assertion:** A tiger can accelerate from rest at the rate of 4 m/s^2 .

Reason: The velocity attained by it in 10 s is 40 m/s.

AI 20. **Assertion:** Sound waves can propagate in space.

Reason: Sound waves needs medium for propagation.

Section 'B'

- AI** 21. Name two local and exotic breeds of bees used for commercial production of honey. List any three qualities for which foreign breed are adopted.

OR

Name the environmental factors related to cultivation practices and crop yield. Explain how they are related to crop yield.

22. (i) What is the cause of sensation of sound due to rolling of thunder ?
 (ii) Give the audible range of human ear.
 (iii) What are infrasonic and ultrasonic waves ?

OR

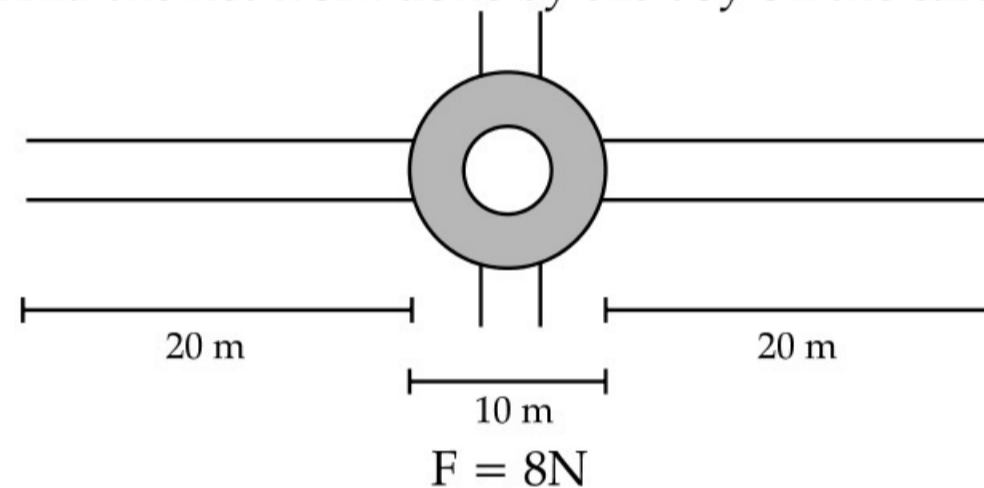
When vertically jerk is given to a string, transverse waves are formed. Give three features of these waves.

23. The kinetic energy of an object moving with a velocity of 5 m/s is 25 J. Find the mass of the object. What will be its kinetic energy when its velocity is made :

(i) two times, (ii) three times ? Justify your answers.

OR

A boy is pulling a cart by supplying a constant force of 8 N on a straight path of 20 m. On a round about of 10 m diameter he forgets the path and takes $1\frac{1}{2}$ turns and then continues on the straight path for another 20 m. Find the net work done by the boy on the cart.



24. Complete the given table :

Disease	Causative organism	Mode of transmission
Dengue fever	(a)	(b)
(c)	<i>Vibrio cholerae</i>	Contaminated food and water
(d)	HIV	(e)
Common cold	Virus	(f)

25. (a) (i) Name the scientist who discovered neutrons.
 (ii) What is the charge and mass of a neutron ?
 (iii) Where is neutron located in an atom ?
 (b) Helium atom has an atomic mass 4 u and its atomic number is 2. How many neutrons does it have ?

26. Write two similarities and one dissimilarity between mitochondria and plastid.

27. Give reasons :

- (i) Why gases exert pressure on the walls of container.
 (ii) Gases undergo diffusion very fast.

- AI** 28. A cyclist moving along a circular path of radius 63 m completes three rounds in 3 minutes. Calculate :

- (i) The total distance covered by him during this time.
 (ii) Net displacement of the cyclist.
 (iii) The speed of the cyclist.

29. (a) What is the relation between the mass m and the weight w of a body ?

- (b) What are the differences between mass and weight ?

30. (a) 'Lactometers are used to determine the purity of a sample of milk'. State the principle on which this instrument is based on.

- (b) Write two factors on which the buoyant force acting on a body when immersed in a liquid depends.

31. Describe an activity to explain the effect of flowing water on the top soil and write your conclusion.
32. (a) Give two reasons to support the statement that CO_2 is a compound and not a mixture.
 (b) Classify the following as pure substance or a mixture. If mixture, indicate whether homogeneous or heterogeneous.
 (i) 24 carat gold (ii) Air
 (iii) Concrete.

OR

- AI (i) Name the separation techniques which you will apply for the separation of the following mixtures :
- (a) Small pieces of metal in the engine oil of a car.
 (b) Fine mud particles suspended in water.
 (c) Oil from water.
 (d) Sodium chloride from its solution in water.
 (e) Camphor from salt.
 (f) Wheat grains from husk.
- (ii) Classify the following as a chemical or physical change :
- (a) Water boils to form steam. (b) Burning of paper.
 (c) An almirah gets rusted. (d) Making a fruit salad with raw fruits.
33. (a) A sample of vitamin C is known to contain 2.58×10^{24} oxygen atoms. How many moles of oxygen atoms are present in the sample ?
 (b) Write one word for the following :
 (i) In a balanced chemical equation, the sum of the masses of reactants and products remains unchanged.
 (ii) A group of atoms carrying a fixed charge on them.
 (c) Write chemical formulae of the following compounds :
 (i) Sodium phosphate (ii) Ammonium carbonate

OR

Verify by calculating that :

- (i) 5 mole of CO_2 and 5 mole of H_2S do not have the same mass.
 (ii) 240 gm of Ca and 240 gm of Mg elements have molar ratio 3 : 5.
 (Atomic mass of C = 12 u, O = 16 u, H = 1 u, S = 32 u, Ca = 40 u, Mg = 24 u)

34. (i) Define momentum. Write its S.I. unit.
 (ii) How much momentum will an object of mass 10 kg transfer to the floor, if it falls from a height of 5 m ($g = 10 \text{ m/s}^2$).
 (iii) Explain how a karate player can break a pile of tiles with a single blow of his hand.
35. (a) Analyse the reason behind the following statements :
 (i) Epidermis is thicker in desert plants though it is usually single layered.
 (ii) Presence of waxy layer (secreted by epidermis) on the outer surface of plants.
 (b) Discuss the cell arrangement which supports the fact that epidermis is a protective tissue.
- AI 36. (a) State the criterion for the classification of organisms as belonging to kingdom Monera or Protista.
 (b) State the kingdom in which you will place an organism which is single celled, eukaryotic and photosynthetic.
 (c) List four conventions which are followed while writing scientific names of living organisms.