ANSWERS TO PRACTICE PAPER-5

1. (*c*) Intermolecular spaces allow ink to diffuse into water.

2. (*a*) It retains its shape due to strong force of attraction between particles.

3. (*d*) They have different atomic number but same mass number.

4. (*d*) Lead has 207 – 82 = 125 neutrons

5. (*d*) 2, 8, 8, 2

6. (*b*) Calcium and phosphorus

7. (*c*) Ligament break

8. (*a*) **9.** (*c*) **10.** (*b*) **11.** (*c*) **12.** (*b*)

13. (*d*) $u = 20$ m/s, $g = -10$ m/s^2,

$v = 0$ (at highest point)

$$v = u + gt$$

$$t = \frac{v - u}{g} = \frac{0 - 20}{10} = 2 \text{ s}$$

Total time in air = $2t$(ascend + descend)

$= 2 \times 2 = 4$ s

14. (*a*) 20 Hz – 20 kHz

15. (*b*) Upthrust = Weight in air – Weight in water

= 10 N – 8 N = 2 N.

16. (*c*) 400 J

K.E. $\alpha\ v^2$

As speed is doubled, KE becomes 4 times.

17. (*a*) Both A and R are true and R is correct explanation of the Assertion.

18. (*b*) Both A and R are true but R is not the correct explanation of the Assertion.

19. (*b*) Both A and R are true but R is not the correct explanation of the Assertion.

20. (*b*) Both A and R are true, but R is not the correct explanation of the assertion.

21. (*a*) The element has electronic configuration 2, 7. Its atomic number is 9.

(*b*) Its valency is equal to 1 due to deficiency of one electron to fully filled outermost shell.

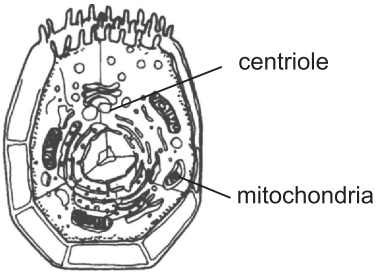
22. (*a*) The solution in which no more solute can be dissolved at a particular temperature is called saturated solution.

(*b*) % by mass = $\frac{\text{Mass of glucose}}{\text{Mass of solution}} \times 100$

$5 = \frac{\text{Mass of glucose}}{200} \times 100$

Mass of glucose = $2 \times 5 = 10$ g

23.



Animal Cell

24. Two Indian breeds of cow are Red Sindhi and Sahiwal.

Or

Two types of food requirement of milch animals are:

(*i*) Maintenance requirement, which is the food required to support the animal to live a healthy life.

(*ii*) Milk producing requirement, which is the type of food required during the lactation period.

25. Two important functions of areolar tissue are as follows:

(*i*) They act as a supporting and packing tissue between organs lying in the body cavity.

(*ii*) They also help in repair of tissues.

26. Power = $\frac{\text{Work done}}{\text{Time}} = \frac{mgh}{t}$

$= \frac{50 \times 10 \times 15}{60} = 125$ W.

Or

The water moves in forward direction. This is due to its inertia of motion.

27. (*a*) Most of alpha rays passes through atom undeviated.

(*b*) Very few rays came back in the same direction.

(*c*) Some rays deviated through larger angles.

28. (*a*) Number of electrons and protons increase from Li(3) to Ne(10).

(*b*) SiO_2

(*c*) Metals form positive ions (cations) as they have extra electrons. By losing these extra electrons, metals achieve noble gas configuration.

29. Mitochondria are called power house of cells as these are sites of synthesis of energy rich ATP molecules by cellular respiration.

Similarities between mitochondria and plastids are-

1. They are cell organelle present in eukaryotic cells.
2. Both of them are semi-autonomous cell organelle.
3. Both mitochondria and plastids have their own DNA for protein synthesis..

Differences:

Mitochondria	Plastid
The main function is respiration.	Main function is photosynthesis.

30. Mitochondria have two membrane coverings. The outer membrane is porous and the inner membrane is deeply folded. The pores provide permeability. The inner folds increase the surface area for ATP generating chemical reactions. Energy required for various chemical activities of life are released by mitochondria in the form of ATP.

Or

(*a*) A cell containing higher water concentration than the surrounding medium will undergo exosmosis and thus lose water.

(*b*) A cell having low water concentration than the surrounding medium will undergo endosmosis and absorbs water from outside.

(*c*) A cell having equal water concentration to its surrounding medium will neither gain or lose water to the external medium.

31. Total distance = 500 m + 100 m = 600 m

Time = 0.5 h = 1800 s

$$\text{Average speed} = \frac{\text{Distance}}{\text{Time}}$$

$$= \frac{600}{1800} = 0.33 \text{ m/s}$$

$$\text{Displacement} = 500 \text{ m} - 100 \text{ m} = 400 \text{ m}$$

$$\text{Average velocity} = \frac{\text{Displacement}}{\text{Time}} = \frac{400}{1800}$$

$$= \frac{2}{9} \text{ m/s}$$

32. Acceleration, $a = -6 \text{ ms}^{-2}$

Final velocity, $v = 0$

Time, $t = 2$ s

Initial velocity,

$$u = v - at$$
$$= 0 - (-6)\ (2)$$
$$= 12\ \text{ms}^{-1}$$

Distance travelled, $s = \dfrac{v^2 - u^2}{2a} = \dfrac{0 - (12)^2}{2 \times (-6)} = 12$ m

33. (*a*) The acceleration experienced by a body during free fall is called acceleration due to gravity.

(*b*) By Newton's second law,

$F = ma$ [m = Mass of body, a = Acceleration]

During free fall, $a = g$

Thus, $F = mg$

By Law of Gravitation,

$F = \dfrac{GMm}{R^2}$ [M = Mass of celestial body, R = Distance between bodies]

Thus, $mg = \dfrac{GMm}{R^2}$

or $g = \boxed{\dfrac{GM}{R^2}}$

Thus, 'g' is independent of mass of falling body.

34. (*a*) It is because very thin sheet of gold metal can be made easily.

(*b*) M^{2+} ion has 10 electrons and 12 neutrons. Its atomic number is 12 because it has 12 protons. Mass number $= p + n$

$= 12 + 12 = 24$

(*c*) The electrons present in outermost shell of an atom are called valence electrons.

(*d*) **Isotopes:** Atoms of same element having same atomic number but different mass number.

Properties:

(*i*) They differ in mass number, i.e. physical properties.

(*ii*) They have same chemical properties because they have same number of valence electrons.

Or

(*a*) Its valency is equal to 2.

(*b*) (*i*) It contains neutrons which do not have charge and positively charged protons, that is why it is heavy and positively charged.

(*ii*) An atom is electrically neutral because it has equal number of electrons (negatively charged) and protons (positively charged) particles.

(*c*) (*i*) Mass number of A = 17 + 18 = 35

Mass number of B = 17 + 20 = 37

(*ii*) Both are isotopes as they have same atomic number but different mass number.

35. Differences:

Striated muscle	Unstriated muscle	Cardiac muscle
(*i*) It is present in limbs, tongue, etc.	(*i*) It is present in visceral organs, iris of eye, etc.	(*i*) It is present in the heart.
(*ii*) Its ends are blunt.	(*ii*) Its ends are tapering.	(*ii*) Its ends are flat and zig-zag.
(*iii*) The cells of this tissue are multinucleate.	(*iii*) The cells of this tissue are uninucleate.	(*iii*) The cells of this tissue are uninucleate.
(*iv*) It contracts rapidly but soon undergoes fatigue.	(*iv*) It contracts slowly and does not get fatigued.	(*iv*) It contracts rapidly but does not get fatigued.
(*v*) It is striated.	(*v*) It is non-striated.	(*v*) It is striated.
(*vi*) It is voluntary.	(*vi*) It is involuntary.	(*vi*) It is involuntary.
(*vii*) It is also called skeletal or voluntary or striped muscle.	(*vii*) It is also called unstriated or involuntary or smooth muscle.	(*vii*) It is also called involuntary or heart muscle.
(*viii*) Alternate light and dark bands or striations are present.	(*viii*) No striations are present.	(*viii*) Faint regular striations are present.

Or

(*a*) Stratified squamous epithelium is present in larynx. It is the voice box that holds vocal cords and is a part of the respiratory system.

(*b*) The epithelial cells are made up of phospholipid that contains specific proteins.

(*c*) Squamous epithelial cells protect the underlying cells from drying, injury, bacterial and viral infection and from the effect of harmful chemicals.

(*d*) Complex tissue (Phloem)

(*e*) Meristematic tissue

36. (*a*) (*i*) The karate player reduces the speed of his hand suddenly to cause a large momentum change of his hand in a very short time. This increases the force acting on the ice slab and it gets broken in a single blow of hand.

(*ii*) Glass ware are covered with cushioning objects so that during transportation, when they experience jerks, the time of a large momentum change increases and less force acts on them. This prevents their breakage or damage.

(*b*) Mass, $m = 70\ g = 0.07\ kg$

Velocity, $v = 0.5\ ms^{-1}$

Initial Momentum of ball,

$p_1 = 0.07 \times 0.5 = 0.035\ kg\ ms^{-1}$

Final momentum $= p_2 = 0$ as the ball stops.

Time $= 0.5\ s$

$$\text{Force applied} = \frac{\text{Momentum change}}{\text{Time}}$$

$$= \frac{p_2 - p_1}{0.5} = \frac{-0.035}{0.5} = -0.07\ N$$

Player exerts a force of 0.07 N on ball in opposite direction.

Or

(*a*) Inertia

(*b*) Force = Mass × Acceleration

(*c*) Momentum

(*d*) Force

(*e*) Third law of motion

37. (*a*) 'C', because the substance is liquid at –150°C as its melting point is –169°C and gas at –100°C as its boiling point is –104°C.

(*b*) 'D' because it has highest melting and boiling point.

(*c*) (*i*) Particles of solid state has highest melting and boiling point.

(*ii*) Particles of gaseous state have highest kinetic energy.

Or

(*c*) (*i*) Kr because it has larger size, more surface area, more forces of attraction.

38. (*a*) The sudden increase is due to chemical fertilizer that supplies the minerals in good quantity. Gradual decrease is due to depletion of nutrients caused by absorption by plants, leaching to lower layers of the soil and killing of decomposers (microbes).

(*b*) **Differences between:**

Manure	Fertilizer
(*i*) A manure is a natural substance obtained by the decomposition of animal wastes and plant residues.	(*i*) A fertilizer is a man-made substance. It is an inorganic salt or an organic compound.
(*ii*) It contains small amounts of essential plant nutrients such as nitrogen, phosphorus and potassium.	(*ii*) It is very rich in plant nutrients such as nitrogen, phosphorus and potassium.

(*c*) Manures supply small quantities of nutrients to the soil as they contain large amounts of organic matter. They enrich soil with nutrients thereby increasing soil fertility.

Or

(*c*) The difference in the two graphs indicates that manuring the soil is more beneficial than the use of chemical fertilisers. Use of fertilisers is harmful, when used in large quantity.

In case of Plot B, the chemical fertilisers may cause various problems when used continuously for long time. Loss of microbial activity reduces decomposition of organic matter and loss of soil fertility affecting the yield.

39. (*a*) Body A is moving with constant speed as it covers equal distance in equal time intervals.

(*b*) non-uniform motion

(*c*) Body C covers maximum distance = 100 m

Or

(*c*) Body A = 20 m