Class9 Science Sample Question Paper 2017-18 -5

Time allowed: 03 Hours   Science Class – IX   Maximum Marks: 80

Section-A

Question numbers 1 and 2 in Section-A are one mark question

1. While playing football the goalkeeper didn't get sufficient time to stop a fast ball shot towards him. Why did he hurt his hand while doing so?

Ans. He hurts his hand because he stop the ball in shot interval and creates lager pressure on his hand. The rate of the change of momentum is directly proportional to force.

2. Mention the physical quantity shown by the slope of a speed - time graph.

Ans. Aceleration

Question numbers 3 to 5 in Section- A are two marks questions

3. How is striated squamous epithelial tissue different from squamous epithelial tissue?

Ans. Simple squamous epithelium has a single layer of flat cells and its main function is in diffusion. Stratified squamous epithelium has a many layers of flat cells and its function is protection as it is thick.

4. (a) State Universal law of Gravitation. (b) Using the formula for "G", find its SI unit.

Ans. The universal law of gravitation states that the force of attraction between two masses m1 and m2 separated by a distance r is directly proportional to the product of the masses and inversely proportional to the square of the distance between the masses.

That is, $F \alpha m1m2$ and $F \alpha 1/r2$

Or, $F = Gm1m2/r2$

Where, G is a constant called the universal gravitational constant and is equal to $6.67 \times 10\text{-}11$ Nm2/kg2

5. What causes Japanese encephalitis? How it can be prevented?

Ans. Japanese encephalitis is caused by JEV or Japanese Encephalitis Virus through bite of infected Culex mosquito.

Prevention

(i)Vaccination

(ii)   Protection from mosquito bite

Question numbers 6 to 15 in Section-A are three marks questions

6. (a) Define matter and write its three states. (b) Explain how these states of matter arise due to variation in the characteristics of the particles.

Ans. anything having mass and occupies space is called matter their three States of matter solid liquid and gas

In solid particles are tightly packed

In gas particles are very loosely packed and in liquid particles are loosely packed.

7. (a) Write any two differences between a chemical change and a physical change. (b) State one instance in which water undergoes a physical change and one in which it undergoes a chemical change.

Ans. (a) Change in which new substances formed is called chemical change. it cannot be reversed

A change in which no new substance is formed is called physical change .it can be easily reversed

(b) Changing of water into ice is an example of physical change and on passing electricity water splits up into H^{+1} and O^{-2} ion so the electrolysis is an example of chemical change of water

8. What is meant by osmosis? What will happen to the living cell if it is kept in a hypertonic solution? Give an example of endosmosis.

Ans. Transfer of substance from high concentration to low concentration through semipermeable membrane is called osmosis.

When cell is kept in hypertonic solution it will brust out.

Examples of Endosmosis - When we put a raisin inside a bowl of water Absorption of capillary water from the soil by the root.

9. (a) Draw a neat and labelled diagram of collenchyma tissue. (b) Do the cells of this tissue have intercellular spaces? Why or why not?

Ans. (b) Cells of collenchyma tissue have small intercellular space so that they provide flexibility to plants.

10. A gun of mass 3 kg fires a bullet of mass 30 g. The bullet takes 0.003 s to move through the barrel of the gun and acquires a velocity of 100 m/s. Calculate: (i) The velocity with which the gun recoils (ii) The force exerted on gunman due to recoil of the gun.

Ans. Given:- mass of gun = 3kg ; mass of bullet = 30g = 0 .03kg; time = 0.003s ; velocity of bullet = 100m/s

Velocity of gun=V_1

According to law of conservation of momentum

$M_1V_1=M_2V_2$ => $3 \times v_1 = 0.03 \times 100$ => $3v_1=3$ => $v_1=3/3$ => $v_1=1$ m/s

Acceleration of bullet $= \dfrac{v-u}{t} = \dfrac{100-0}{0.003} = 100 \times \dfrac{1000}{3}$

Force =mass x acceleration $= \dfrac{0.03 \times 100000}{3} = 1000N$

11. Rameshwar took the responsibility of his fields when his father got old. His father advised him to use farmyard manure over fertilizers but he wanted to use chemical fertilizers. His father told him about the adverse effects of chemical fertilizers to the nearby water bodies. Rameshwar's father encouraged him and his friends also to use organic manure and careful and judicious use of chemical fertilizers.

(i) Why the chemical fertilizers must be used carefully and judiciously?

(ii) Manures are natural fertilizers. How can they be prepared in the field?

(iii) Why did Rameshwar's father advise him?

Ans. (a) chemicals fertilizer make the soil acidic and reduce fertility of soil. These chemicals when run off into river pollute water bodies

(b) Manure can be prepared by composting or by gathering animal wastes into pit where anaerobic bacteria conversion it into manure.

(c) Rameshwar's father wanted his son to be aware of the harmful effects of chemicals used in fertilizer.

12. Calcium carbonate decomposes on heating to form calcium oxide and carbon dioxide. When 10g of calcium carbonate is decomposed completely then 5.6g of calcium oxide is formed? Calculate the mass of carbon dioxide formed. Which law of chemical combination will you use in solving this problem? State the law.

Ans. Mass of $CO_2 =$ 10 - 5.6 = 4.4g

Law of the conservation of mass. This states that the mass is neither created nor destroyed. In a closed system, mass of reactants is equal to mass of products.

13. Give three differences between Monocot and Dicot Plant.

Ans. Monocot have fibrous root and dicot have tap.

Monocot have parallel venation where as dicot have reticulate venation

Monocots have their vascular bundles scattered throughout the stem. Dicots, however, maintain their vascular bundles in a ring around the outer layer of the stem

14. Q. (a) Write the no. of valence electrons in

(a) (i) Na atom and Na$^+$ ion (ii) O atom and O^{-2} ion

(b) An element "E" loses 2e to form E^{+2} ion. What will be the chemical formula of the compound formed between E and oxygen?

Ans. (a) (i) valence electrons in Na atom is 1 and Valence Electrons in Na^{+1} ion is 8

(¡¡) Valence Electrons in oxygen atom is 6 and valence electrons in oxygen ion fees is 8

(b) EO

15. The following figure shows a waves of frequency 50 Hz
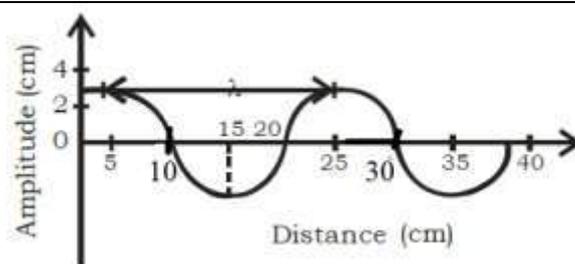
Find: (a) The amplitude

(b) The wavelength

(c) The velocity of the wave.

Ans. (a) The amplitude = 3cm

(b) The wavelength = 20cm = 0.2m

(c) The velocity of the wave = 0.2 x 50 = 10m/s

Question numbers 16 to 21 in Section- A are 5 marks questions

16. (a) Define evaporation and explain the role of speed of wind at the rate of evaporation. (b) Why do we feel cool when we sit under fan during summer?

Ans. (a) Evaporation process of conversion of water into water vapor.

The rate of evaporation increases with the wind speed. With the increase in wind speed, the particles of water vapour move away with the wind, decreasing the amount of water vapour in the surrounding.

(b) When we sit under fan wind help in evaporation of sweat from our body because of this our body release heat during evaporation that's why we feel cool when we sit under fan.

17. (a) Define tissue. What is the importance of tissues in multicellular organisms ? (b) Are plants and animals made of same types of tissues? If no, then. Write three points of difference.

Ans. (a) group of cells similar in structure and function are called tissues.

In multicellular organism tissue perform different functions. Tissue also provide structural and mechanical strength .

(b) Plant tissue consists of both living and non-living cells.

Most plant tissues possess an unlimited growth.

Most plant tissues provide mechanical support.

Animal tissue consists of only living cells.

Animal tissues possess a limited growth.

Most animal tissues support locomotion.

18. (i) Define relative density. Give its mathematical formula. (ii) Define density. Give its SI unit.

(iii) A solid weighs 80 g in air, 64 g in water. Calculate the relative density of solid.

(iv) When kept in water, state if the object would float or sink?

Ans. (i) The relative density of a substance is the ratio of its density to that of water.

Relative density = Density of substance/density of water.

It has no unit as it is the ratio of same quality.

(Ii) Density of a substance is its mass per unit volume. The symbol most often used for density is ρ (the lower case Greek letter rho), although the Latin letter D can also be used.

(¡¡¡) RD of solid relative density = weight in air / weight loss in water

R.D = 80/80-64 => R.D = 80/16 = 5 g/cm³   but, density of water = 1 g/cm³ So the object would sink

(Iv) If the relative density of substance is greater than density of water (1 g/cm³) therefore the object will sink unless float.

19. Explain the following phenomena on the basis of Newton's Laws of Motion :

(i) Falling of buildings during an earthquake.   (ii) Shattering of car windows due to a bomb blast.

(iii) Cell phone breaks into pieces on falling from a table.

OR, (a) for a moving object, derive graphically relation between final velocity v, initial velocity u, acceleration "a" and time "t".

(b) Draw the distance-time graph for the following situations:

(i) When a body is stationary   **(ii) When a body is moving with a uniform speed.**

(iii) When a body is moving with non-uniform speed.

Ans. a. Falling of buildings during an earthquake is due to inertia of rest

As the buildings are at rest they oppose the change in its state of rest during earthquake. So as the earth quakes the buildings fall down.

b. Windows of the cars Shatter due to a bomb blast due to impulse. A certain impulse applied for a short time will give a large force so the glass breaks.

c. Cell phone breaks into pieces on falling from a table due to impulse caused due to the reaction of the ground as the Cell phone applies the action force on the ground due to its falling.

A certain impulse applied for a short time will give a large force so the Cell phone breaks into pieces.

20. (a) From Rutherford"s α -particle scattering experiment, give the experimental evidence for deriving the conclusion that : (i) most of the space inside the atom is empty. (ii) the nucleus of an atom is positively charged.

(b) An element has mass number 32 and atomic number 16, find:

(i) the number of neutrons in the atom of the element and

(ii) the number of electrons in the outermost shell of the atom.

Ans. (a) (¡)A major fraction of the α-particles bombarded towards the gold sheet passed through it without any deflection, and hence most of the space in an atom is empty.

(¡¡)Some of the α-particles were deflected by the gold sheet by very small angles, and hence the positive charge in an atom is not uniformly distributed. The positive charge in an atom is concentrated in a very small volume called nucleus.

(b) (¡) number of neutron = 32-16=16

(ii) Atomic no. = 16 = 2,8,6

The number of electrons in the outermost shell of the atom.=6

21. Explain the following statements:

(a) Being disease free, is not the same as being healthy.   (b) Community health is essential for good individual health.   (c) Villagers suffer with cholera more than urban people.

OR, "On exposure with an infectious microbe does not necessarily mean developing noticeable disease". Do you agree? Explain with reason. If yes, how severe infections occur in our body?

Ans. (a) Being healthy means a state of complete physical, mental and social well being where as being disease free means a state of absence of discomfort in any part of body.

(b) Community health means the health of the surrounding in which a person lives so it affects the Individual health

(c) cholera spread due to drinking of impure water. Since villagers not have facility of clean drinking water during rain and flood so they suffer more than urban people.

Or, Becoming exposed to or infected with an infectious microbe does not necessarily mean developing noticeable disease. Explain.

Because of strong immune system, our body is normally fighting off microbes. We have cells which are specialised to kill the pathogenic microbes. These cells are active when infecting microbes enter the body and if they are successful in removing the pathogen, we remain disease-free. So even if we are exposed to infectious microbes, it is not necessary, that we suffer from diseases.

Section-B

Question numbers 22 to 27 in Section- B are based on practical skills. Each question is a two marks question

22. How do we test the stability of a solution? List two solutions which exhibit this property.

Ans. Stability of any solution is tested by seeing that whether the solute and the solvent, that are the main constituents of the solution, remain miscible, stay together, even after very long time after stirring and mixing them.

Example are (a) True solutions : Sugar solution in water, lemonade etc.

(b)Colloidal solution : Milk, soap solution

23. Nisha determined the boiling point of water and thought of doing another experiment. She took aqueous solution of salt and repeated the experiment. Would there be any change in boiling point? Why?

Ans. Boiling point increases due to impurities like salt present in water.

24. Label A, B, C and D in given diagram:

25. When an object is kept on a liquid, then two forces act on it. Name the two forces and their directions.

Ans. Gravitational force in downward direction and buoyancy force in upward direction.

26. In the experiment of "observing and comparing pressure exerted by iron cuboid on sand bed", what is the conclusion drawn from the experiment? Does it match with the theoretical aspect?

Ans. Conclusions drawn from the experiment:

1. The pressure in sand is greater when the solid iron cuboid is placed on its least surface area.

2. The pressure exerted by the smallest surface area is greater than the other surfaces with larger areas.

Yes, it matches with theoretical aspect

27. After observing an earthworm carefully, Samir decided to place it in phylum Annelida. Which two features did he observe that helped him do so?

Ans. They are bilaterally symmetrical, have a true body cavity.

They have segmented body.