

CHAROTAR ENGLISH MEDIUM SCHOOL

Annual Exam 2018-19

(Answer Key)

Science

Std. 9

SECTION – A

Questions numbers 1 to 16 are one marks questions. These are to be answered in one words or in one sentence. (Each questions 1 marks) [16]

1. What do we get from cereals, pulses, fruits and vegetables. ?

Ans. We get carbohydrates from cereals, proteins from pulses, vitamins and minerals from fruits and vegetables.

2. Chemical substances that are used to protect plants from pests are called.....

Ans. Pesticides

3. What is soil erosion?

Ans. Removal of the top fertile layer and useful components of the soil, which adversely affects the fertility of the soil is called soil erosion.

4. UV rays cause a reaction, whereby O_2 changes in to.....

- A. O_2 B. SO_2 C. CO D. None of these

Ans. D. None of these

5. Which of the following is spread through water?

- A. Jaundice B. Whooping cough C. Tuberculosis D. Malaria

Ans. A. Jaundice

6. Another name for.....diseases is infectious diseases.

Ans. Communicable

7. Speed is never

- A. Zero B. Fraction C. Negative D. Positive

Ans. C. Negative

8. What is Velocity.

Ans. Is the speed of an object moving in a definite direction. It is the rate of change of displacement. Velocity is a vector quantity.

Velocity = Displacement/Time

9. What is the primary characteristic on which the first division of organism is made. ?

Ans. Nature of cell, i.e, if the organism is prokaryotic or eukaryotic.

10. Can you name the two organelles we have studied that contain their own genetic material ?

Ans. The two cell organelles that contain their own genetic material are mitochondria and plastids.

11. Helium atom has an atomic mass of 4u and two protons in its nucleus. How many neutrons does it have ?

Ans. Atomic mass of Helium = 4u

No. of protons = 2

. ∴ No. of neutrons = 4 – 2 = 2

12. Give two uses of Isotopes.

Ans. ${}^{60}_{37}\text{Co}$, an isotops of cobalt is used in the treatment of cancer.

${}^{235}_{92}\text{U}$, an isotops of uranium is used as a fuel in nuclear reactors

13. The chemical formula of sodium sulphate is

A. NaSO_4 B. Na_2SO_4 C. $\text{Na}(\text{SO})_4)_3$ D. None of these

Ans. A. NaSO_4

14. Which postulate of Dalton's atomic theory is the result of the law of conservation of mass. ?

Ans. Atomic are indivisible particles and can neither be created nor destroyed during any physical or chemical reaction.

15. What is Chromatography.

Ans. It is a technique used for the separation of coloured components of a mixture.

16. Intermolecular spaces are minimum in

A. Solids B. Liquids C. Gases D. All of these

Ans. A. Solids

SECTION – B

Questions numbers 17 to 26 are two marks questions. These are to be answered in about 40 to 50 words. (Each questions 2 marks) [20]

17. How fishes are obtained. ?

Ans. → Fishes are obtained by capture and culture fisheries. In capture fisheries, fishes are caught from natural water bodies

→ In culture fisheries, fishes are reared in artificial water resources.

18. What is immunization?

Ans. → The process of developing resistance towards a disease by vaccination is called immunization.

→ In this process people are given a particular vaccine so that they develop immunity against a particular infectious disease.

OR

18. What are communicable diseases? Give two examples.

Ans. → Communicable diseases are diseases that spread from an infected person to a healthy person by actual contact between them.

→ Examples include chicken pox, typhoid etc.

19. What is sound and how is it produced ?

Ans. → Sound is a form of energy which produces a sensation of hearing in our ears.

→ It is produced due to the vibrations of a body about its mean position.

→ For example, a bell and wires in a sitar produce sound on vibrating.

OR

19. What will be the frequency of a wave whose time period is 0.5 s?

Ans. As frequency = $\frac{1}{\text{Time period}} = \frac{1}{0.5} = \frac{10}{5} = 2 \text{ Hz.}$

20. A lamp consumes 1,000 J of electric energy in 10 s. What is its power ?

Ans. W = 1,000 J, T = 10s, P = ?

$$P = \frac{\text{Work of energy}}{\text{Time}} = \frac{1000}{10}$$

$$P = 100 \text{ watt.}$$

21. A battery lights a bulb. Describe the energy changes involved in the process.

Ans. → In a battery, the chemical energy is first converted to electrical energy.

→ Electrical energy supplied by the battery is being converted in to heat and light energy.

22. What do you mean by free fall. ?

Ans. → An object is said to be in a state of free fall when it falls towards the earth only due to the gravitational force of the earth.

It falls towards the centre of the earth with an acceleration of 9.8 ms^{-2} (usually called acceleration due to gravity).

OR

22. What is the importance of the universal law of gravitation?

Ans. The universal law of gravitation successfully explains that

→ All bodies, small or large attract each other.

→ The gravitational force binds us to the earth.

→ The motion of the moon around the earth is due to gravitational force.

→ The motion of the earth and other planets around the sun is due to gravitational force.

→ Artificial satellites move around the earth due to gravitational force.

23. Explain why it is difficult for a fireman to hold a hose, which ejects large amount of water at a high velocity.

Ans. → When water is ejected in the forward direction from a hose with a force(action), then water exerts a reaction on the hose in the backward direction.

→ Due to backward movement of the hose, it is difficult for the fireman to hold the hose.

24. Why do we classify organisms?

Ans. → Classification helps in the study of wide variety of organisms in a simple way.

→ It reveals interrelationship among organisms.

→ It help in understanding the evolution of organisms.

25. Draw a labeled diagram of a neuron.

Ans.

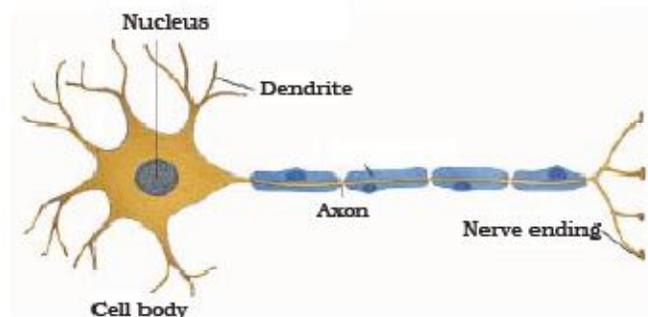


Fig. 6.12: Neuron-unit of nervous tissue

26. What is Physical and Chemical changes.

Ans. → A physical change is a change in which only physical properties undergo change and no new substances are formed.

→ A chemical change is a change in which chemical properties undergo change and new substances are formed.

→ A physical change is temporary and can be reversed. A chemical change is permanent and can't be reversed.

→ Some changes like burning of a candle involve both physical as well as chemical change.

SECTION – C

Questions numbers 27 to 34 are three marks questions. These are to be answered in about 60 to 80 words. (Each questions 3 marks) [24]

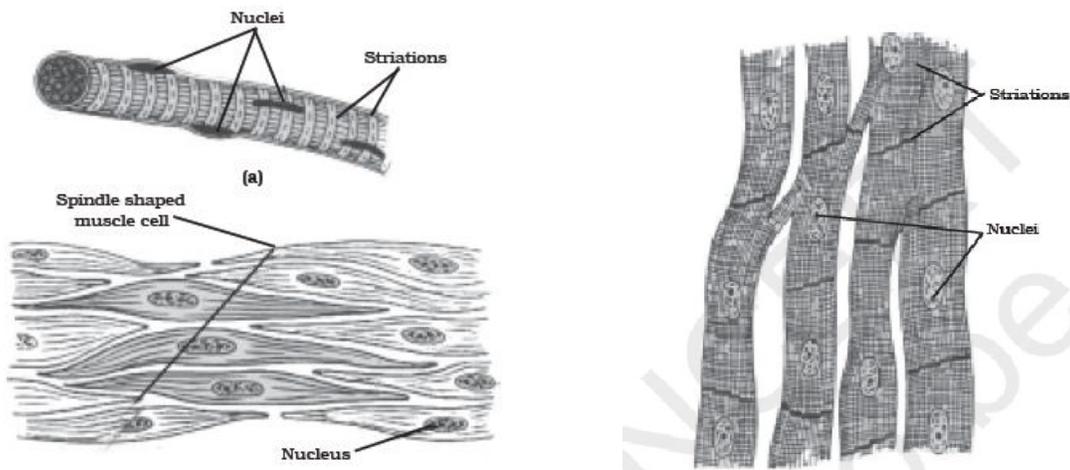
27. Define evaporation and sublimation.

Ans. → **Evaporation** : The phenomenon of conversion of a liquid in to a gas at any temperature below its melting point is called evaporation.

→ **Sublimation** : The phenomenon of conversion of a solid in to a gas without changing in to intermediate liquid state is called sublimation.

28. Diagrammatically show the differences between three types of muscle fibers.

Ans. →



Smooth, Striated muscle, Cardiac muscle.

29. List the points of differences between homogeneous and heterogeneous mixtures.

Ans. → Homogeneous mixture :

- It consists of a single phase.
- It has a uniform composition throughout.
- It has the same properties throughout the bulk.
- There are no visible boundaries between its components.

Examples : Sodium chloride dissolved in water and sugar dissolves in water.

→ Heterogeneous mixture :

- It consists of two or more phases.
- It does not have a uniform composition.
- It does not have the same properties throughout the bulk.
- There are visible boundaries of separation between its components.

Examples : Air, gun powder, iron filings, sand and sulphur.

30. Calculate the molecular masses of CH_3OH , C_2H_6 , and C_2H_4

Ans. → Molecular mass of $\text{CH}_3\text{OH} = 12 + 3 \times 1 + 16 + 1 = 12 + 3 + 16 + 1 = 32 \text{ u}$

→ Molecular mass of $\text{C}_2\text{H}_6 = 2 \times 12 + 6 \times 1 = 24 + 6 = 30 \text{ u}$

→ Molecular mass of $\text{C}_2\text{H}_4 = 2 \times 12 + 4 \times 1 = 24 + 4 = 28 \text{ u}$

31. What is osmosis?

Ans. → Osmosis is a special case of diffusion of water through a selectively permeable membrane.

→ It is the movement of water from a region of higher concentration to a region of lower concentration through a semi-permeable membrane.

32. List few functions of lymph.

Ans. → Functions of lymph are :

→ Lymph transport oxygen, nutrients, hormones, etc. to body cells and transport carbon dioxide and other metabolic wastes from the body cells to the blood.

→ It protects the body against infection as it is loaded with lymphocytes.

→ It keeps the body cells moist.

33. A racing car has a uniform acceleration of 4 ms^{-2} . What distance will it cover in 10 s after start?

Ans. → $u = 0$, $t = 10 \text{ s}$, $a = 4 \text{ m/s}^2$, $s = ?$

Using $s = ut + \frac{1}{2}at^2$

$$s = (0)(10) + \frac{1}{2}(4)(10)^2$$

$$s = 0 + 200 \quad s = 200 \text{ m}$$

OR

33. A motorboat starting from rest on a lake accelerates in a straight line at a constant rate of 3.0 ms^{-2} for 8.0 s. How far does the boat travel during this time?

Ans. → $u = 0$, $a = 3 \text{ m/s}^2$, $t = 8 \text{ s}$, $s = ?$

Using $s = ut + \frac{1}{2}at^2$

$$s = 0 + \frac{1}{2} \times 3 (8)^2$$

$$s = 96 \text{ m}$$

34. Explain the Structure of human ear with diagram.

Ans. → The ear is a sensitive organ of our body which produces sensation of hearing. It converts compressions and rarefactions of frequency range 20 Hz to 20,000 Hz into electric signals that travel to brain via auditory nerve.

→ The ear consists of three sections – the outer ear, the middle ear and the inner ear.

→ The outer ear consists of pinna and auditory canal. Pinna is a cup-shaped fleshy part of the outer ear. It collects and amplifies sound waves which then pass through the auditory canal.

→ At the end of auditory canal, there is a thin membrane called tympanic membrane or ear drum. When compression reaches the ear drum, the pressure on membrane increases and the ear drum is forced inwards. When rarefaction reaches the ear drum, it moves outwards.

→ The vibrations are amplified by lever action of three bones called hammer, anvil and stirrup in the middle ear, In turn the middle ear transmits the amplified pressure variations to the inner ear.

→ The brain interprets them as sound. In fact, we do not hear with ears, we hear with the brain through our ears.

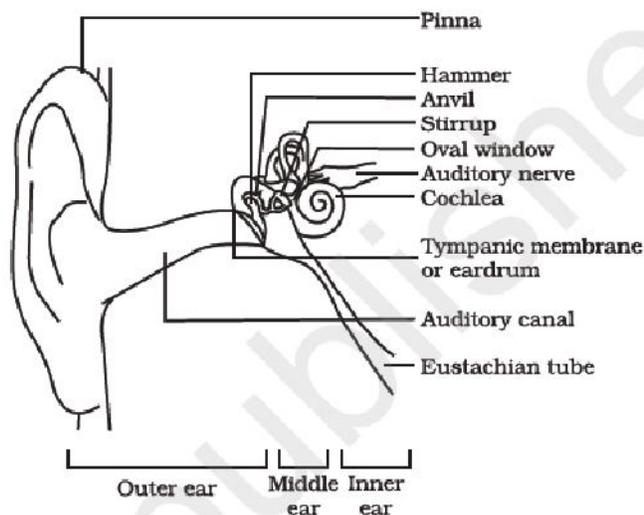


Fig. 12.19: Auditoru parts of human ear.

SECTION – D

Questions numbers 35 to 39 are four marks questions. These are to be answered in about 90 to 120 words. (Each questions 4 marks) [20]

35. Explain Rutherford's Model of an Atom.

Ans. → Rutherford and his co-workers made a fundamental contribution in understanding the structure of the atom and establishing the presence of a small nucleus in the atom.

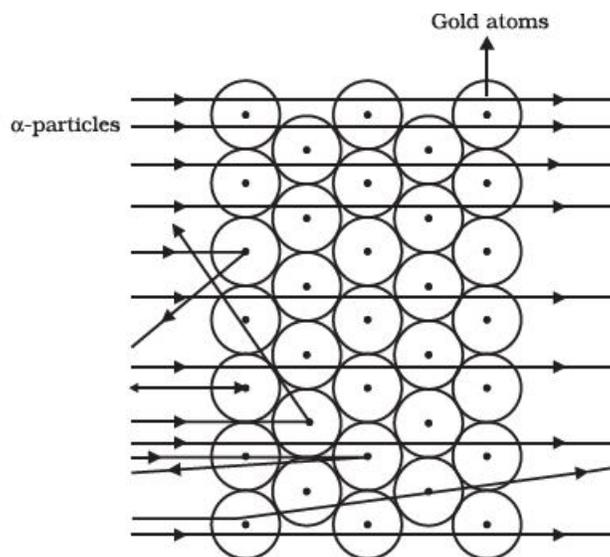


Fig. 4.2: Scattering of α -particles by a gold foil

→ They performed a number of experiments known as scattering experiments. They took very thin sheets of gold foil (only 4×10^{-5} cm thick) and bombarded it with a stream of alpha (α) particles. The alpha particles are positively charged helium ions (He^{2+}) which carry two units of positive charge and mass four times that of an atom of hydrogen (i.e., mass of helium ions = 4 a.m.u.). These are emitted from radioactive elements such as radium.

➤ **Following important observations :**

- Most of the fast moving α -particles passed straight through the gold foil without any deflection from their original path.
- Some of the α -particles were deflected from their path through small angles.
- Very few (about 1 in 12,000) did not pass through the foil at all but suffered large deflections (more than 90°) or even came back in the direction from which they came.

➤ **The main conclusions of Rutherford's experiment :**

- Most of the space inside the atom is empty. Therefore, most of the α -particles went through the gold foil without deflecting from their path.
- There is a positive tiny part in the atom in its centre, which deflects or repels the α -particles. This must be containing the whole mass of the atom. Moreover, this mass must be occupying a very small space within the atom because only a few α -particles suffered large deflections.
- This positively charged heavy mass in the centre of the atom is called nucleus. The α -particle get deflected from their normal path when they came close to nucleus due to force of repulsion (similar charges).

OR

35. Draw a sketch of Bohr's model of an atom with three shells.

Ans. →

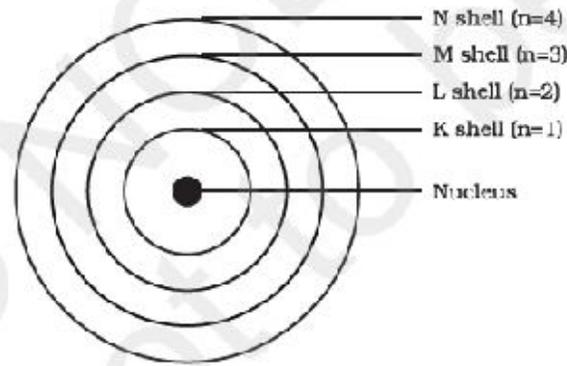


Fig. 4.3: A few energy levels in an atom

36. How are pteridophytes different from phanerogams.

Ans. > Pteridophytes :

- Seeds are not formed.
- Secondary growth absent.
- Reproductive organs are hidden.
- **Example** : Ferns, Selaginella.

> Phanerogams :

- Seeds are formed.
- Secondary growth present.
- Well developed, exposed reproductive organs are present.
- **Example** : Cycas, Pinus.

37. Explain uniform and non-uniform motion by giving examples.

Ans. > Uniform Motion

- A body is said to be in a state of uniform motion if it travels equal distances in equal intervals of time.
- If the time distance graph is a straight line the motion is said to be uniform motion.
- **Example** : If Car covers 20 m in every 1 second, it should cover 10 m in every half second and 5 m in every one-fourth second. In case of uniform motion, the graph between time and distance is a straight line. The slope of distance-time graph gives the velocity.

> Non-uniform motion

- A body has a non-uniform motion if it travels unequal distances in equal intervals of time. e.g. a freely falling body.
- Time - distance graph for a body with non-uniform motion is a curved line.

→ **Example** : It covers a distance of

$4.9 \times 1^2 = 4.9$ m in 1 s, $4.9 \times 2^2 = 19.6$ m in 2 s, $4.9 \times 3^2 = 44.1$ m in 3 s

Thus distance covered in first second is 4.9 m; in 2nd second,

distance covered = $19.6 - 4.9 = 14.7$ m; in 3rd second, the distance covered is $44.1 - 19.6 = 24.5$ m and so on. Thus in non-uniform motion, the body covers unequal distance in equal intervals of time.

38. What are the differences between the mass of an object and its weight.?

Ans. > **Mass** :

→ Mass is the quantity of matter contained in a body.

→ Mass is a scalar quantity.

→ Mass of a body is same everywhere.

→ Mass is measured by physical balance.

→ SI unit of mass is kg.

→ Mass of a body is never zero.

> **Weight** :

→ Weight is the force with which a body is attracted towards the centre of the earth.

→ Weight is a vector quantity.

→ Weight of a body is different at different places.

→ Weight is measured by spring balance.

→ SI unit of weight is newton.

→ Weight of a body at the centre of the earth is zero.

39. Show a diagrammatic representation of the carbon cycle.

Ans.

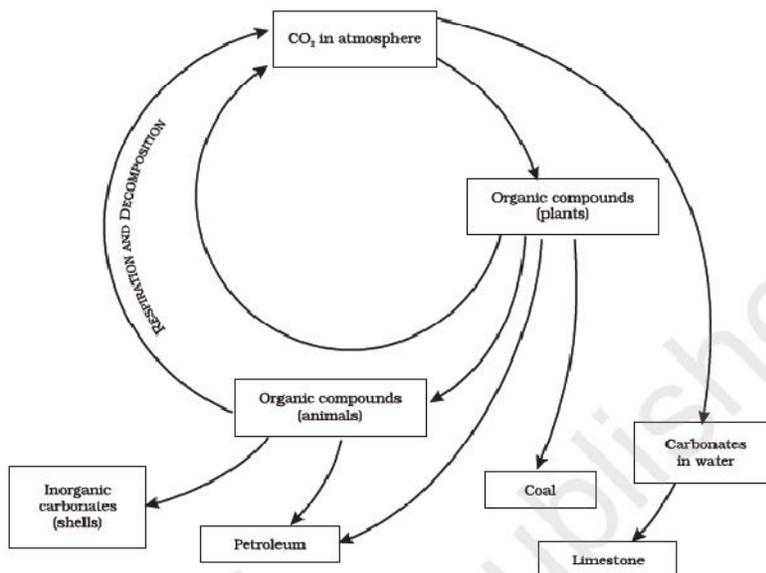


Fig. 14.7: Carbon-cycle in nature

OR

39. What causes winds ?

Ans. → Movement of air or winds are caused by the uneven heating of the atmosphere in different regions of the Earth.

→ Air above the land gets heated faster and, being light, starts rising. As the hot air rises, a region of low pressure is created. Due to this, cooler air over the sea moves in to this area of low pressure.

→ Other factors which control wind are :

- (a) The rotation of the Earth and presence of mountain ranges
- (b) Uneven heating of land in different parts of the world.
- (c) Differences in heating and cooling of land and water bodies.