ARYAN INSTITUTE

CBSE Class IX
Subject – Science

Time allowed: 3 hours   **Maximum Marks: 80**

General Instructions:

(i) The question paper comprises 36 questions divided into three sections, A, B and C.

(ii) All questions are compulsory.

(v) Question number 1 and 20 in Section-A are multiple choice type questions and carry one mark each.

(vi) Question number 21 to 30 in Section-B are short answer type questions and carry 3 marks each.

(vii) Question number 31 to 36 in Section-C are long answer type questions and carry 5 marks each.

Section A

1. 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 (iii)
(b) (i) and (iv)
(c) (ii) and (iii)
(d) (ii) and (iv)

2. When heat is constantly supplied by a burner to boiling water, then the temperature of water during vaporisation :
(a) Rises very slowly
(b) Rises rapidly until steam is produced
(c) First rises and then becomes constant
(d) Does not rise at al

3. When sodium sulphate solution reacts with barium chloride solution the substance which will appear as precipitate is:

(a) Barnum chloride   (b) Barium sulphate

(c) Sodium sulphate   (d) Sodium chloride

4. In 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

5. Which of the following contains maximum number of molecules?

(a) 19 CO_2

(b) 1 g N_2

(c) 1 g H_2

(d) 1 g CH_4

6. How many atoms of oxygen are present in 300 grams of $CaCO_3$?

(a) 54.207×10^{23}

(b) 6.207×10^{23}

(c) 12.207×10^{23}

(d) 22.2×10^{23}

7. Why was the Thomson's Model of an atom failed?

(i) It could not explain the screening of negative charges from that of positive

(ii) It did not tell about the presence of electrons

(iii) It did not give an idea about the discrete energy levels

(iv) It explained the atom as a whole to be electrically neutral

Choose the correct option from the following:

    (a) Only (iii)
    (b) Both (i) & (iii)
    (c) Only (i)
    (d) Both (ii) & (iv)

8. Among the following statements which one is incorrect?

(a) Golgi apparatus is involved with formation of lysosomes.

(b) Nucleus, mitochondria and plastid have DNA, hence they are able to make their own structural proteins.

(c) Lysosomes are called the suicide bags as they eat up their own cells.

(d) Cytoplasm is called known as protoplasm.

9. Given below is a diagram showing the structure of a neuron tissue.

Neuron
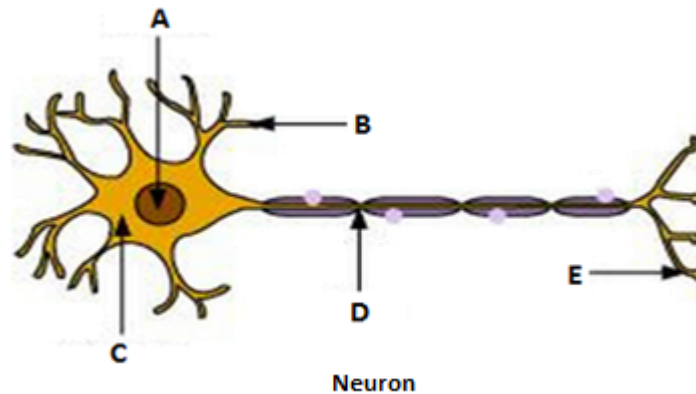
Choose the correct labeling for the parts A, B, C, D and E.

(a) A – Nucleus; B – Cell body; C – Dendrite; D – Axon; E – Nerve ending.

(b) A – Nucleus; B – Dendrite; C – Cell body; D – Nerve ending; E – Axon.

(c) A – Nucleus; B – Axon; C – Cell body; D – Dendrite; E –Nerve ending.

(d) A – Nucleus; B – Dendrite; C – Cell body; D – Axon; E – Nerve ending

10. Which of the following statements is incorrect?

(i) Parenchyma tissues have intercellular spaces.

(ii) Collenchymatous tissues are irregularly thickened at corners.

(iii) Apical and intercalary meristems are permanent tissues.

(iv) Meristematic tissues, in its early stage, lack vacuoles.

    (a) (i) and (ii)

    (b) Only (iii)

    (c) (iii) and (iv)

    (d) Only (ii)

11. The main characteristic feature of angiosperms is:

(a) Seeds are naked in fruits

(b) Seeds are covered with coats and are in fruits

(c) Fruits are without seeds

(d) Seeds are naked without fruits

12. From the given v-t graph, it can be inferred that the object is
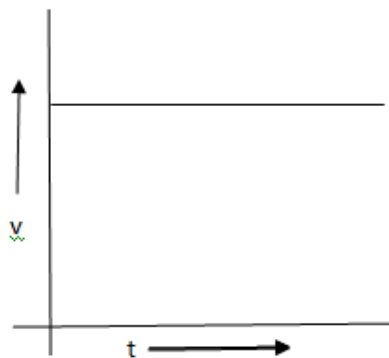
(a) At rest

(b) In uniform motion

(c) Moving with uniform acceleration

(d) In non-uniform motion

13. The inertia of a moving object depends on:

(i) Mass of the object

(ii) Momentum of the object

(iii) Speed of the object

(iv) Shape of the object

Choose the correct option:

    (a) a and b
    (b) only a
    (c) only b
    (d) c and d

14. A stone is released from the top of a tower of height 19.6 m. Calculate its final velocity just before touching the ground. ($g = 9.8$ m/s^2)

(a) 384.16 m/ s

(b) 196 m/s

(c) 19.6 m/s

(d) 3841.4 m/s

15. The school bags are generally provided with the broad strips because:

(a) It will spread the force of the bag over the large area of the shoulder of the child producing large pressure.

(b) It will spread the force of the bag over the large area of the shoulder of the child producing less pressure.

(c) It has become a trend among the students to carry the bags with wide strips.

(d) It will spread the force of the bag over the small area of the shoulder of the child producing less pressure.

16. Congenital diseases are those which
(a) are deficiency diseases
(b) are present from time of birth
(c) are spread from man to man
(d) occur during life time

17. Binomial nomenclature consists of two words
(a) genus and species
(b) order and family
(c) family and genus
(d) species and variety

18. A plant body not differentiated into root, stem and leaves is termed as
(a) thallus
(b) mycelium
(c) hyphae
(d) herb

19. For any substance the temperature remains same during the change of state due to

_____.

(a) loss of heat

(b) latent heat

(c) less supply of heat

(d) lattice energy

20. When the liquid is spun rapidly, the denser particles are forced to the bottom and the lighter particles stay at the top. This principle is used in:

(a) Centrifugation

(b) Fractional distillation

(c) Evaporation

(d) Tunneling

Section B

21. A flask contains 4.4g of CO_2 gas. Calculate

(a) How many moles of CO_2 gas does it contain?

(b) How many molecules of CO_2 gas are present in the sample.

(c) How many atoms of oxygen are present in the given sample. [Atomic mass of C is12u and that of O is16u]

22. (a) When we open the cap of a cola drink (or any carbonated beverage), why does excess of bubbles come out?

(b) What are the physical states of dispersed phase and dispersion medium in a soft drink.

23. (a) Discuss briefly the principle of immunization.

(b) Mention any two diseases that can be prevented by immunization.

24. (a) Define the term scintillations?

(b) Write postulates of Rutherford's Nuclear Model of atom?

25. (a) What are Cryptogams? Why are they called so?

(b) Differentiate between Bryophyta and Pteridophyta. Give one example of each.

OR

25. Explain the following terms:

(i) Bilateral symmetry

(ii) Triploblastic animals

(iii) Open circulatory system.

26. When a bullet is fired from a rifle its momentum become 20 kg m/s. If the velocity of the bullet is 1000m/s what will be its mass?

Or

26. What happens to the passengers travelling in a bus when the bus suddenly stops? Give reasons for your answer.

27. (a) List four main processes involved in the water cycle.

(b) Give a diagrammatic representation of Carbon Cycle in nature.

28. (a) Identify two features possessed by all Chordates.
(b) In which class would you place any organism which has:

(i) A scaly exoskeleton and a bony endoskeleton
(ii) A scaly exoskeleton and lay eggs outside water.

29. (a) State two principles of treatment of a disease.

(b) Define immunization.

30. (a) Why is soil replenishment essential?

(a) What is hybridisation in plants? Mention any two desired characters for which it is done.

SECTION-C

31. (a) How would you arrive at a mathematical formula to measure force using second law of motion? Define the unit of force using this formula.
(b) A bullet of mass 10 g travelling horizontally with a velocity of 150 ms^{-1} strike a stationary wooden block and comes to rest in 0.03 s. Calculate the distance of penetration of the bullet into the block. Also, calculate the magnitude of the force exerted by the wooden block on the bullet.

32. (a) Define work. Give SI unit of work done. Write an expression for positive work done.
(b) Calculate the work done in pushing a cart through a distance of 50 m against the force of friction equal to 250 N. Also state the type of work done.
(c) What will be the work done if displacement of the object is perpendicular to the direction of force?
(d) When an object moves on a circular path, what will be the work done?

OR

(a) Define potential energy of an object. Give an expression for gravitational potential energy.
(b) A car of mass 2000 Kg is lifted up a distance of 30 m by a crane in 2 minutes. What is the power supplied by the crane? ($g = 9.8$ ms^{-2})

33. Wet clothes dry up similarly when we spill water on the floor it dries up after sometime. In both the cdses change of state from liquid to vapour takes place without reaching the boiling point.
    (i)   What is this phenomenon called?
    (ii) Explain how the change occurs at temperatures lower than the boiling point.
    (iii) Mention three factors which determine the rate at which the change of state from water to vapours occurs at room temperature.

34. Rahul's mother mixed oil and water in kitchen by mistake. Rahul told her that he can separate the mixture. Name the technique used by Rahul and explain how he will do. Draw the diagram and write the principle of this technique.

35. The immune system of Hari is damaged by the attack of pathogen on his body.

    (i)   Name the disease he is suffering from.
    (ii) Name the pathogen that has attacked his body.
    (iii) Mention any three modes of transmission of this disease.

36. Answer the following :-
    (i)   Draw a labeled diagram of smooth muscle.
    (ii) Differentiate between parenchyma and sclerenchyma.
    (iii) Name the epithelium which has hair-like projection on outer surface of the cells.
    (iv) Name a tissue that stores fat in the body.