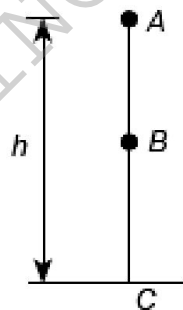


**General Instructions:**

- All questions are compulsory.
- The question paper comprises of **two Sections, A and B**. You are to attempt both the sections.
- All questions of **Section-A** and **Section-B** are to be attempted separately.
- There is an internal choice in three questions of three marks each and two question of five marks.
- Question number **1 to 2** in **Section-A** are **one mark** question. These are to be answered in **one word** or in **one sentence**.
- Question numbers **3 to 5** in **Section-A** are **two marks** questions. These are to be answered in about **30 words** each.
- Question numbers **6 to 15** in **Section-A** are **three marks** questions. These are to be answered in about **50 words** each.
- Question numbers **16 to 21** in **Section-A** are **five marks** questions. These are to be answered in about **70 words** each.
- Question numbers **22 to 27** in **Section-B** are questions based on practical skills and are **two marks** questions.

**SECTION – A**

- Write the criteria used for the classification of organisms as proposed by Whittaker.
- What causes the phenomena of sunrise, sunset and change of seasons? How do we perceive this cause?
- Differentiate between kharif and rabi crops. Mention the months in which these are sown. Give one example of each.
- Give reasons for the following:
  - It is dangerous to jump out of a moving bus.
  - Vehicles are provided with shockers.
- Write any two applications of chromatography. Also write a condition necessary for chromatography.
- State Law of Conservation of Energy and express it in the form of an equation for a body of mass  $m$  falling from a point A at height  $h$ , above the ground at (a) A, (b) B at a height from ground, (c) C.



OR

Define power. State commercial unit and SI unit of electrical energy. An electric heater of 400 W works for 2 hours. Find the electrical energy units consumed in a day.

7. (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.

**OR**

- (a) Why does the water kept in an earthen pot become cool in summer?  
(b) Draw a well labelled diagram showing sublimation of camphor.  
(c) Convert: 340 K to degree Celsius.

8. Draw labelled diagram of the apparatus used to separate a mixture of two immiscible liquids.
9. Define mass number and atomic number. How are these represented around the symbol of an element? The mass number and atomic number of an isotope of uranium (U) are 235 and 92 respectively. Calculate the number of protons and neutrons in the nucleus of the atom.
10. What is xylem? Name the four elements of xylem and write one function of each.

11. List in the tabular form any three differences between the Aves and the Mammalia group.

**OR**

List some adaptations of reptiles towards terrestrial mode of life.

12. (a) Define average speed.  
(b) A bus travels a distance of 120 km with a speed of 40 km/h and returns with a speed of 30 km/h. Calculate the average speed for the entire journey.
13. Car A of mass 1500 kg travelling at 25 m/s collides with another car B of mass 1000 kg travelling at 15 m/s in the same direction. After collision, the velocity of car A becomes 20 m/s. Calculate the velocity of car B after collision.
14. What is meant by buoyancy? Why does an object float or sink when placed on the surface of a liquid?
15. Write the full form of AIDS. List four modes of transmission of virus of this disease.

16. Verify by calculating the following:

- (a) Number of molecules in 100 g of  $\text{NH}_3$  is more than 100 g of  $\text{N}_2$  [Atomic mass of N = 14 u, H = 1 u]  
(b) 60 g of carbon and 60 g of magnesium elements have a molar ratio 2 : 1 [Atomic mass of C = 12 u, Mg = 24 u].

17. (a) Explain why did Rutherford select a gold foil in his alpha scattering experiments?  
(b) What observations in a scattering experiment led Rutherford to make the following observations:  
(i) Most of the space in an atom is empty.  
(ii) Nucleus is positively charged.  
(c) Mention any two drawbacks of Rutherford's model.

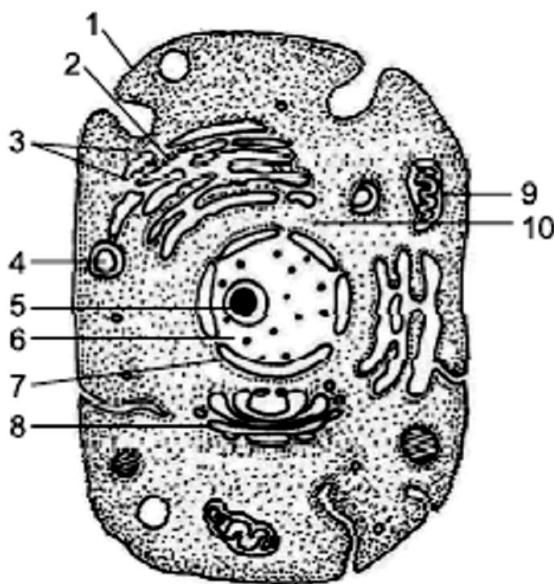
**OR**

- (a) The average atomic mass of a sample of an element X is 16.2 u. What are the percentage of isotope  ${}_8^{16}\text{X}$  and  ${}_8^{18}\text{X}$  in the sample.  
(b) On the basis of Thomson's model of an atom explain how the atom is neutral as a whole.

18. (a) Differentiate between acceleration due to gravity and universal gravitational constant. Derive a relation between 'g' and 'G'.  
(b) State universal law of Gravitation.
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19. Given below is a diagrammatic sketch of electron microscopic view of an animal cell :

- Label the parts indicated by lines as 1 to 10.
- Give two reasons to support that it is an animal cell.
- How many mitochondria are shown in the diagram?



**A type of animal cell**

- Explain the formation of complex permanent tissue in plants. Mention two types of complex tissues and write their functions.
  - How simple permanent tissues are different from complex permanent tissues?

**OR**

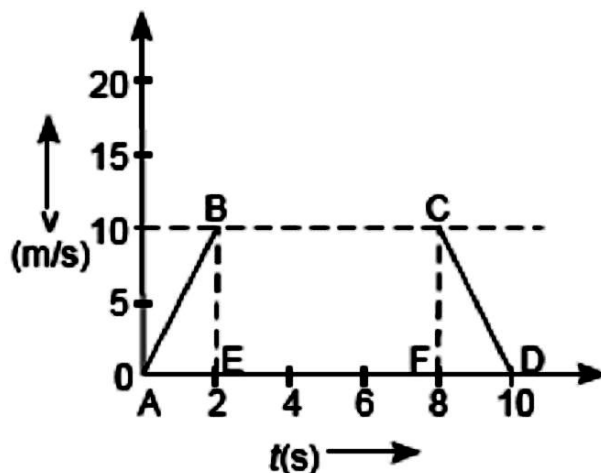
What are neurons? Where are they found in the body? What functions do they perform in the body of an organism?

- Define work. Give SI unit of work. Write an expression for positive work done.
  - 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.
  - Sarita lives on 3rd floor of building at the height of 15 m. She carries her school bag weighting 5.2 kg from the ground floor to her house. Find the amount of work done by her and identify the force against which she has done work ( $g = 10 \text{ ms}^{-2}$ )

### SECTION – B

- Arrange the following substances in increasing order of force of attraction between the particles: (a) water (b) hydrogen (c) sand
  - Why does the temperature remain constant at the melting point?
- Select an element that is:
  - ductile
  - conductor of electricity
  - a constituent of water
  - liquid at room temperature
- A mother who had suffered from chicken pox in her childhood, is now taking care of her child who is suffering from the same disease. What are the chances of her mother having chicken pox? Explain.

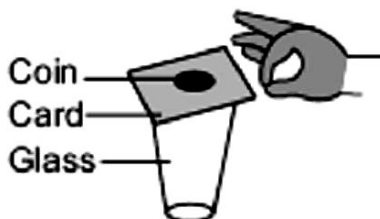
25. Find the displacement of a body whose velocity time graph is shown below:



OR

Even when a body covers equal distances in equal time intervals, its velocity can be variable. Comment giving an example.

26. In the below experimental set-up, a student gives the card a sharp and fast horizontal flick with a finger.



- (i) What will happen to the coin?
- (ii) State reason for your answer.

27. Name the various techniques or practices used for achieving sustainable agriculture.

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