

SUBJECT: SCIENCE

MAX. MARKS : 80

CLASS : IX

DURATION : 3 HRS

**General Instructions:**

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

**SECTION – A**

1. Name the tissue present under the skin and arranged in a pattern of layers.
2. State the law of inertia.
3. Define biotic factors. Name a few biotic factors which damage the food material during storage.
4. Why is the motion of a train starting from one station and stopping at the other is non-uniform?
5. Give reason:
  - (a) Steam produces more severe burns as compared to boiling water.
  - (b) Temperature of a liquid does not change when it boils.
6.
  - (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.
7. Why copper sulphate solution in water does not show tyndall effect but mixture of water and milk shows.

**OR**

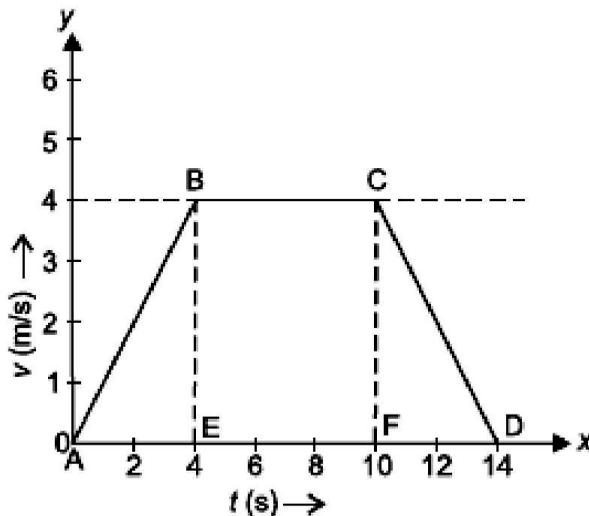
Name the separation technique by which we can obtain coloured components from ink? Give two more application of the technique used.

8.
  - (a) Identify the class of animals having the following characteristic features.
    - (i) The warm blooded animals that lay eggs and have four chambered heart and a covering of feathers.
    - (ii) The cold blooded animals having scales and they breath through lungs.
  - (b) Give one example of an animal belonging to each of these classes:

**OR**

- (a) Draw a neat diagram of a Hydra.
- (b) Label mesoglea and gastrovascular cavity.
- (c) Name the group of animals it belongs to.
- (d) Name one species of this group which lives in colonies.

9. (a) Define polyatomic ion.  
 (b) Write the name of the compound  $(\text{NH}_4)_2\text{SO}_4$  and mention the ions present in it.
10. What does DNA molecule contain? Name the functional segment of DNA. In which form is the DNA present in a cell when the cell is not dividing ?
11. Study the given graph and answer the following questions.  
 (i) Which part of the graph shows accelerated motion?  
 (ii) Which part of the graph shows retarded motion?  
 (iii) Calculate the distance travelled by the body in first 4 seconds of journey graphically.



12. (a) State the law of conservation of momentum.  
 (b) A body of mass 2 kg, initially moving with a velocity of 10 m/s, collides with another body of mass 5 kg at rest. After collision velocity of first body becomes 1 m/s. Find the velocity of second body.
13. What happens to the magnitude of the force of gravitation between two objects if  
 (i) distance between the objects is tripled?  
 (ii) mass of both object is doubled?  
 (iii) mass of both objects as well as distance between them is doubled?
14. Differentiate between  
 (a) Acute and chronic disease  
 (b) Congenital and acquired disease  
 (c) Infectious and non-infectious disease.
15. (a) Define 'potential energy'.  
 (b) Give an example where potential energy is acquired by a body due to change in its shape.  
 (c) A skier of mass 50 kg stands at A at the top of a ski jump. He takes off at A for his jump to B. Calculate the change in his gravitational potential energy between A and B.

OR

- (a) Define kinetic energy.  
 (b) A stone of mass 2 kg is falling from rest from the top of a steep hill. What will be its kinetic energy after 5 s? ( $g = 10 \text{ ms}^{-2}$ )
16. (a) Write chemical formulae of all the compounds that can be formed by the combination of the following ions:  $\text{Ca}^{2+}$ ,  $\text{K}^+$ ,  $\text{Fe}^{3+}$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$   
 (b) Molar mass of nitrogen is 14u. What will be the mass of one atom of nitrogen in grams?

17. (a) Define work. Give SI unit of work. 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) 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 ( $g = 10 \text{ ms}^{-2}$ )
18. (a) State the three observations made by Rutherford on his  $\alpha$ -particle scattering experiment.  
 (b) Write the Electronic Configuration of an element whose mass number is 31 and atomic number is 15. What is its valency?

**OR**

- (a) Define Valency. What conclusions can be drawn about the reactivity of an atom from its valency?  
 (b) Why does an atom of Argon have zero valency? Explain using the electronic configuration of Argon.
19. Why is mitochondria called 'power-house of cell'? Give three similarities and one difference between mitochondria and plastid.
20. (a) Explain the formation of complex permanent tissue in plants. Mention two types of complex tissues and write their functions.  
 (b) How simple permanent tissues are different from complex permanent tissues?

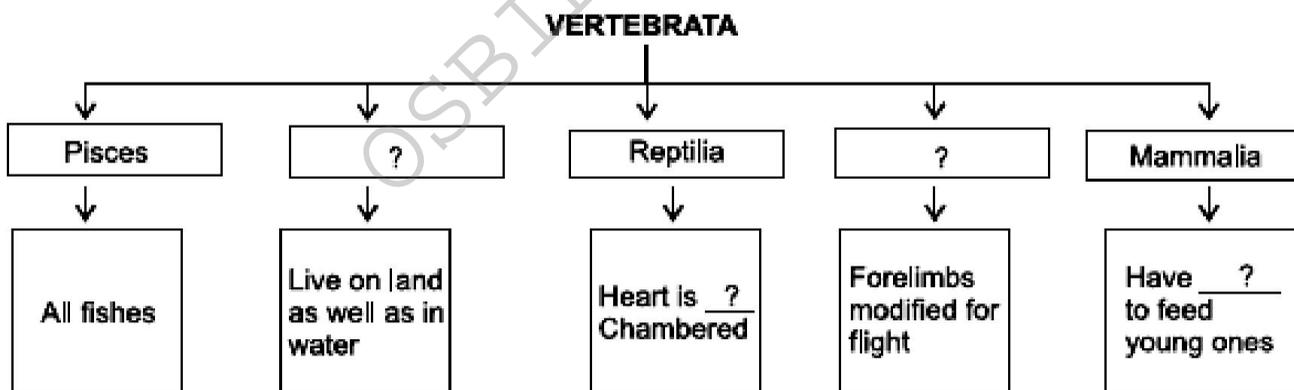
**OR**

What is a nervous tissue? Give its functions. Explain the structure of a neuron with a diagram.

21. What is upthrust? What are the quantities that can vary upthrust? How does it account for the floating of a body? When a partially immersed body is pressed down a little, what will happen to the upthrust?

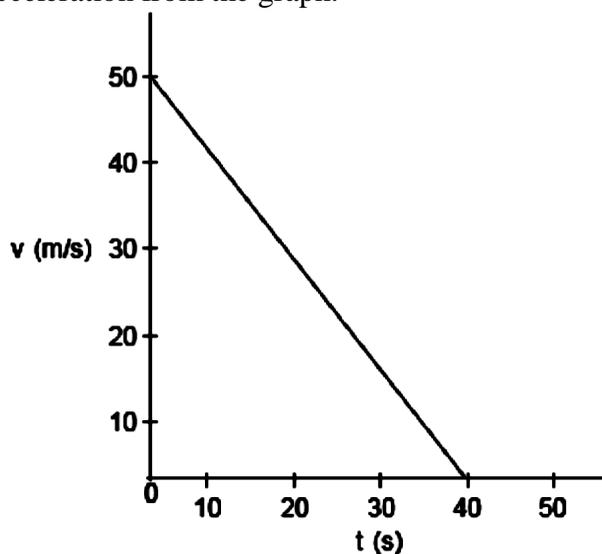
## SECTION – B

22. (i) Give the difference between mixture and compound.  
 (ii) Classify the following mixture as homogeneous and heterogeneous:  
 (a) Tincture of iodine (b) Smoke (c) Brass (d) Sugar solution
23. Atomic number of aluminium is 13 and mass number is 27. Calculate the number of electrons, protons and neutrons in its atom. Represent the ion of this element.
24. Complete:



25. Why simply increasing grain production for storage in warehouses cannot solve the problem of malnutrition and hunger?

26. (a) What can be depicted from the graph regarding the motion of the object?  
(b) Find the value of acceleration from the graph.



27. Identify the effect of force in each of the following:

- (a) compressing a spring
- (b) a tennis player hitting a ball
- (c) stopping a moving car
- (d) kicking a stationary football.

**OR**

If you are trying to push a heavy box on a horizontal surface, list various forces acting on the box. State the condition under which this box will start sliding on the surface. How will the magnitude of applied force required to move the box change if:

- (a) weight of the box is increased?
- (b) the surface on which the box is placed is made more rough?



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