CLASS IX – SCIENCE PRACTICE PAPER (2026-27)

Chapter 3: Tissues in Action

Max. Marks: 40 **Time Allowed: 1 hour 30 minutes**

General Instructions:

(i) This question paper consists of **20 questions** in **5 sections (A to E)**. All questions are compulsory. Internal choice is given in some questions.

(ii) **Section A** has 10 questions of 1 mark each: Q1–8 are Multiple Choice Questions and Q9–10 are Assertion–Reason questions.

(iii) **Section B** has 4 Very Short Answer questions of 2 marks each (about 30–40 words).

(iv) **Section C** has 3 Short Answer questions of 3 marks each (about 50–60 words).

(v) **Section D** has 2 Case-Based questions of 4 marks each.

(vi) **Section E** has 1 Long Answer question of 5 marks with an internal choice.

(vii) Questions are competency-based and application-oriented. Show all steps in numerical questions.

(viii) **Questions 2, 6, 12, 16, 19 and 20 are figure-based** and refer to Fig. 1 to Fig. 6.

SECTION A – Objective Questions (10 × 1 = 10 marks)

1 Which of the following sets of features allows the cells of a meristematic tissue to divide continuously and rapidly? **1**

(A) Thin walls, dense cytoplasm, a large prominent nucleus and no large vacuoles

(B) Thick lignified walls, a small nucleus and large vacuoles

(C) Unevenly thickened corners, large vacuoles and little cytoplasm

(D) Dead cells with hollow cavities and thick walls

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2 **[Figure-based]** Fig. 1 shows the growth of the roots of two onion bulbs, Jar A and Jar B. On day 4 the root tips of Jar B were cut by about 1 cm. Which conclusion can be drawn from the graph? **1**

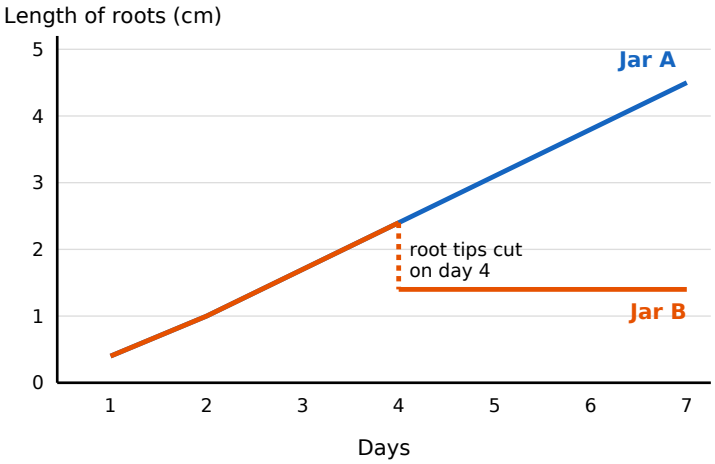


Fig. 1: Growth of onion roots in Jar A and Jar B

(A) Roots grow equally from all their parts.

(B) Roots grow only from their tips, where cells divide actively.

(C) Cutting the root tips makes roots grow faster.

(D) Roots stop growing in plain water after four days.

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3 Grass starts growing again soon after it has been mowed. This is mainly due to the presence of: **1**

(A) apical meristem at the root tip

(B) lateral meristem in the stem

(C) intercalary meristem at the base of the internodes

(D) epidermis with a thick cuticle

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4 A disease blocks the sieve tubes of a plant. Which process will be directly affected? **1**

(A) Upward movement of water from the roots
(B) Transport of food from the leaves to other parts of the plant
(C) Gaseous exchange through the stomata
(D) Rigidity of the stem

5 A simple permanent tissue consists of living cells with unevenly thickened corners due to deposition of pectin. It allows stems and tendrils to bend without breaking. The tissue is: **1**

(A) Parenchyma
(B) Collenchyma
(C) Sclerenchyma
(D) Xylem

6 **[Figure-based]** Fig. 2 shows the transverse section (T.S.) of a sunflower stem with parts labelled P, Q, R and S. Which labelled part transports food prepared in the leaves to other parts of the plant? **1**

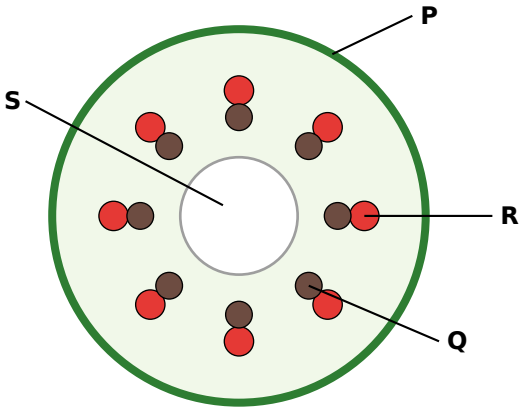


Fig. 2: T.S. of a stem (P: outermost layer, Q: brown, R: red, S: central region)

(A) P
(B) Q
(C) R
(D) S

7 Which type of epithelial tissue is best suited for the rapid exchange of gases in the lungs? **1**

(A) Many layers of flat cells with tightly packed outer cells
(B) A single layer of thin, flat cells
(C) A single layer of tall, pillar-like cells with hair-like structures
(D) Specialised receptor cells with cilia

8 Tendons are tough connective tissues that connect: **1**

(A) muscle to bone
(B) bone to bone
(C) muscle to muscle
(D) skin to muscle

Questions 9 and 10 consist of two statements: Assertion (A) and Reason (R). Choose the correct option:
(A) Both A and R are true, and R is the correct explanation of A.
(B) Both A and R are true, and R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

9 **Assertion (A):** Xylem is called a complex permanent tissue. **1**

Reason (R): Xylem is made up of more than one type of cell: tracheids, vessels, xylem parenchyma and xylem fibres.

10 **Assertion (A):** The shoulder joint allows movement of the arm in many directions. **1**

Reason (R): The shoulder is a hinge joint, which moves in only one direction like a door.

SECTION B – Very Short Answer Questions (4 × 2 = 8 marks)

11 Differentiate between **meristematic tissue** and **permanent tissue** on any two points. (1 + 1) **2**

12 **[Figure-based]** Fig. 3 shows the cross-section of the trunk of a tree. Each dark and light band together forms one annual ring. The band marked X is the narrowest. **2**

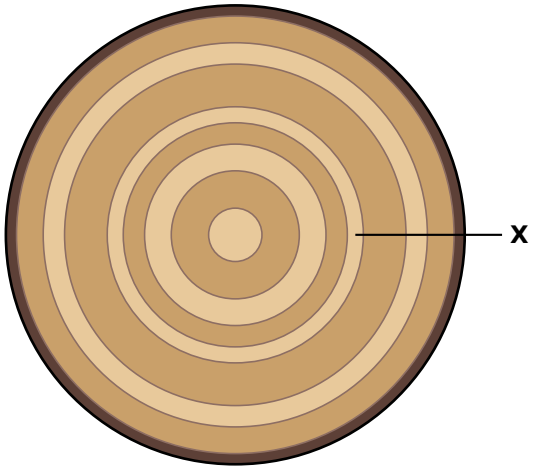


Fig. 3: Annual rings in a tree trunk

(a) Count the annual rings and estimate the age of the tree. (1)

(b) What does the narrow band X tell us about the conditions in that year? Name the meristem that forms such rings. (1)

13 Name **two** structures or parts of the epidermis of a plant and write one function of each. (1 + 1) **2**

14 *Attempt either option A or B.* **2**

A. The epithelial tissue lining the blood vessels and lungs is a single layer of thin, flat cells. Explain how this structure suits its function. (2)

OR

B. Differentiate between bone and cartilage on the basis of their matrix and function. (1 + 1)

SECTION C – Short Answer Questions (3 × 3 = 9 marks)

15 Differentiate between **xylem** and **phloem** on any three points. (1 + 1 + 1) **3**

16 **[Figure-based]** Fig. 4 shows a nerve cell with four parts labelled P, Q, R and S. **3**

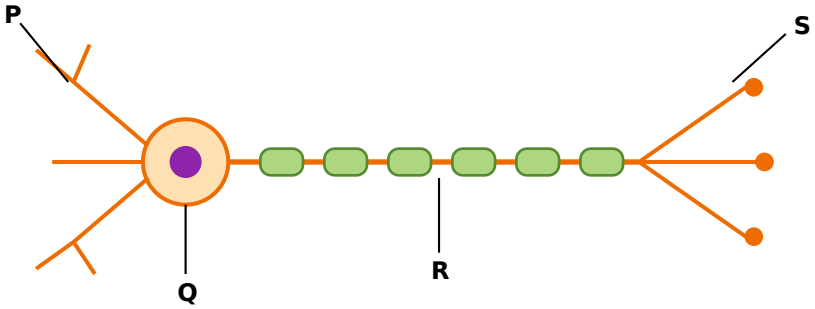


Fig. 4: A nerve cell

(i) Name the parts P and R. (1)

(ii) Which labelled part receives signals from other neurons and which carries messages away from the cell body? (1)

(iii) Name the tissue formed by such cells and state its general function in the body. (1)

17 *Attempt either option A or B.* **3**

A. Plants have three types of meristematic tissue. Name them, state where each is located and how each helps the plant to grow. (3)

OR

B. Compare skeletal, smooth and cardiac muscles. Mention for each whether it is voluntary or involuntary and where it is found. (3)

SECTION D – Case-Based Questions (2 × 4 = 8 marks)

18 **Case Study: What Is in a Drop of Blood?** **4**

Blood is a fluid connective tissue. When a blood sample is kept in a test tube and allowed to separate, it forms two parts: a liquid part called plasma, which makes up 55 per cent of the total volume, and the formed elements (RBCs, WBCs and platelets), which make up the remaining 45 per cent. The red colour of blood is due to haemoglobin, an iron-rich protein present in the RBCs. A technician separates a 20 mL blood sample in this way.

(i) Calculate the volume of plasma in the sample. (1)

(ii) Calculate the volume of the formed elements in the sample. (1)

(iii) Name the formed element that helps in blood clotting at the site of a cut. (1)

(iv) What do WBCs do at an infected area, and what visible signs result? (1)

19 Case Study: Joints of the Human Skeleton **4**

[Figure-based] A student studies a model of the human skeleton. Fig. 5 shows four joints labelled A, B, C and D. A is between the bones of the skull, B is at the shoulder, C is at the elbow and D is where the skull rests on the backbone.

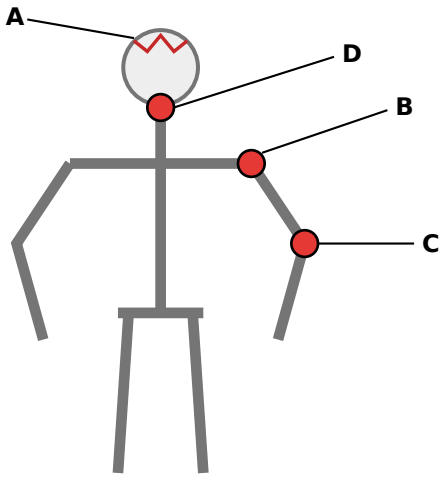


Fig. 5: Joints in the human skeleton

(i) Name the type of joint at A and state why its bones cannot move. (1)

(ii) Name the type of joint at B and write one movement it allows. (1)

(iii) Name the type of joint at C and state in how many directions it moves. (1)

(iv) The head can be turned from side to side like a doorknob in its socket. Name the type of joint D that allows this. (1)

SECTION E – Long Answer Question (1 × 5 = 5 marks)

20 **[Figure-based]** Fig. 6 shows a simple diagram of a knee joint with structures labelled P, Q, R, S and T. **5**

Attempt either option A or B.

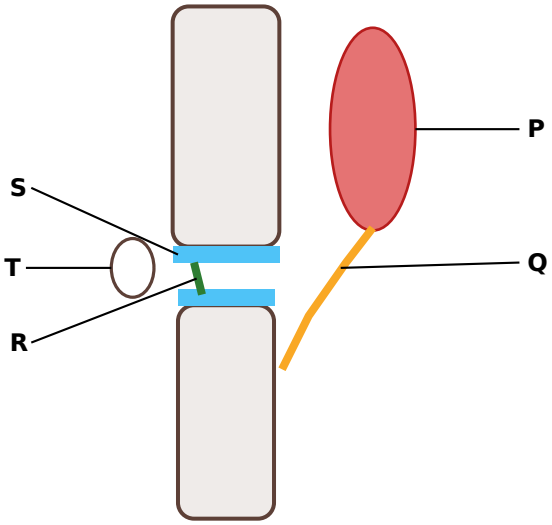


Fig. 6: Structures at a knee joint

A.

(i) Name the structures Q and R. (1)

(ii) How does Q differ from R in the function it performs? (1)

(iii) S is a soft, flexible tissue at the ends of the bones. Name it and state its function. (1)

(iv) Name the type of joint at the knee and state how it moves. (1)

(v) P is a muscle attached to the skeleton. Name its type and state whether its movements are voluntary or involuntary. (1)

OR

B.

(i) Explain how P and Q together bring about movement at the joint. (1)

(ii) Which tissue controls and coordinates the working of P? (1)

(iii) What could happen at the joint if R were torn? (1)

(iv) State the function of the small bone T. (1)

(v) Differentiate between the matrix of bone and the matrix of cartilage. (1)

***** END OF QUESTION PAPER *****