



QUESTION WORKBOOK

Plan diagrams and tissue sections

Cells, microscopy and biological organisation · Unit B01

OCR A 3.1.3, 4.1.1 · Edexcel B 2.1 vii, 4.4 vi · CAIE 7.1, 8.1, 9.1

14 questions · 44 marks

NAVY SCREEN EDITION

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SECTION A · Short, 1 to 2 marks**A1**

PDR-Q6

State two rules of the low-power plan diagram convention, and state what a plan diagram records that a high-power drawing does not. [2]

A2

PDR-Q14

Explain why the cartilage in the tracheal wall forms an incomplete C-shape rather than a complete ring. [2]

A3

PDR-Q15

State the typical ratio of erythrocytes to white blood cells seen in a field of a blood smear, and state one feature of an erythrocyte's appearance that follows from its biconcave shape. [2]

SECTION B · Standard, 3 to 5 marks**B1**

PDR-Q7

Describe the layers of the wall of the trachea in order from the lumen outward, naming the tissue found in each layer. [5]

B2

PDR-Q1

Describe the distribution of xylem and phloem in a transverse section of the root and of the stem of a herbaceous dicotyledonous plant.

[4]

B3

PDR-Q8

A transverse section of a herbaceous dicot stem is 4.0 mm across, and its ring of vascular bundles lies 0.50 mm in from the epidermis. A student draws a low-power plan diagram of the section as a circle 120 mm across. Calculate the magnification to be written on the student's plan, calculate how far in from its outer line the ring of vascular bundles must be drawn, and state which rule of the plan diagram convention the second calculation serves.

[4]

B4

PDR-Q9

State the four named blood cells of a stained smear in order of increasing diameter, giving an approximate size in micrometres for each.

[4]

B5

PDR-Q2

A root carries its xylem as a central column, while a stem carries its lignified vascular bundles in a ring near its surface. Suggest why each arrangement suits the forces that organ must withstand. [3]

B6

PDR-Q3

Identify each of the following cells seen on a stained blood smear, giving a reason for each: cell A is 12 μm across with a nucleus of three connected lobes; cell B is 18 μm across with a kidney-shaped nucleus; cell C is 7 μm across and has no nucleus. [3]

B7

PDR-Q5

Sections are taken through three different airways. Describe how the cartilage seen in each section allows the trachea, a bronchus and a bronchiole to be told apart. [3]

B8

PDR-Q10

Describe the distribution of xylem and phloem in a transverse section through the midrib of a leaf, and describe how this arrangement relates to the arrangement in the stem the leaf grew from. [3]

B9

PDR-Q11

A student cuts a sunflower stem twice, once transversely and once longitudinally through its centre, and the longitudinal section shows no vascular tissue at all. Explain why this section might show no vascular bundles, and explain why this does not mean the stem lacks vascular tissue. [3]

B10

PDR-Q12

Compare a low-power plan diagram with a high-power biological drawing, referring to what each records and how many cells each shows. [3]

B11

PDR-Q13

A cross-section is cut through a leaf blade away from the midrib, between two of the smaller veins. Suggest why this section is much less useful than a section through the midrib for showing the position of xylem relative to phloem. [3]

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