Oxford Cambridge and RSA

GCSE Biology A (Gateway)

J247/04 Biology A B4-B6 and B7 (Higher Tier)

Question Set: 22

1 A salt marsh is a large muddy area of land where a river joins the sea. This is a rare habitat and some plants grow on salt marshes but nowhere else.

(a) When the tide comes in the salt marsh gets covered with seawater.

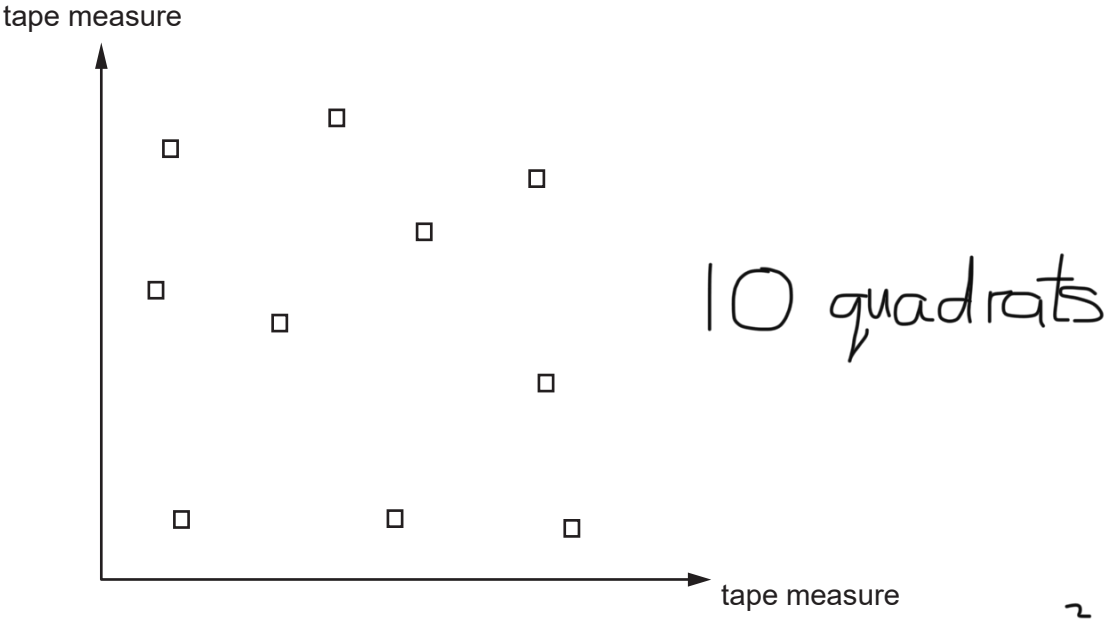
Explain the effects of salt water on plant cells. **[1]**

Plant cells lose water so shrink. (plasmolyse)

(b) A student investigates the plants growing on a salt marsh. He uses a quadrat to sample the plants.

He puts down two long tape measures at right angles to each other across the salt marsh. He then picks numbers at random and uses them to decide where to place a quadrat.

The diagram shows the position of all his quadrats across the salt marsh.



10 quadrats

(i) The salt marsh measured 50 m × 50 m.

Each quadrat measured 0.5 m × 0.5 m.

$0.5 \times 0.5 = 0.25 m^2$

$0.25 \times 10 = 2.5 m^2$

$50 \times 50 = 2500 m^2$

Calculate the percentage of the whole salt marsh that was sampled by the student. **[3]**

$\frac{2.5}{2500} = 0.001 \times 100 = 0.1\%$

(ii) A second student sampled by placing five quadrats close together in the centre of the salt marsh.

Evaluate the sampling method of the second student compared to the method of the first student.

Random sampling (first student) is less biased so results will be more reliable. The second student does not have a fair representation of the salt marsh & results may be biased. **[3]**

(iii) Suggest **one** factor that the students should consider in a risk assessment for their experiment.

The weather conditions may be dangerous. **[1]**

(c) In some salt marshes large sand banks have been built. This stops tides from entering thesalt marsh.

The level of soil on the salt marsh builds up and the marsh turns into dry land.

This dry land shows a greater biodiversity of plants than a salt marsh.

Explain why some scientists want to limit the building of sand banks, even though they increase biodiversity.

It decreases the number of salt marshes and salt marshes are the habitats of many species. Salt marshes absorb floodwater so prevent flooding. **[2]**

that don't live in dry land

Total Marks for Question Set 22: 10