

Name of the Student: _____

Max. Marks : 19 Marks

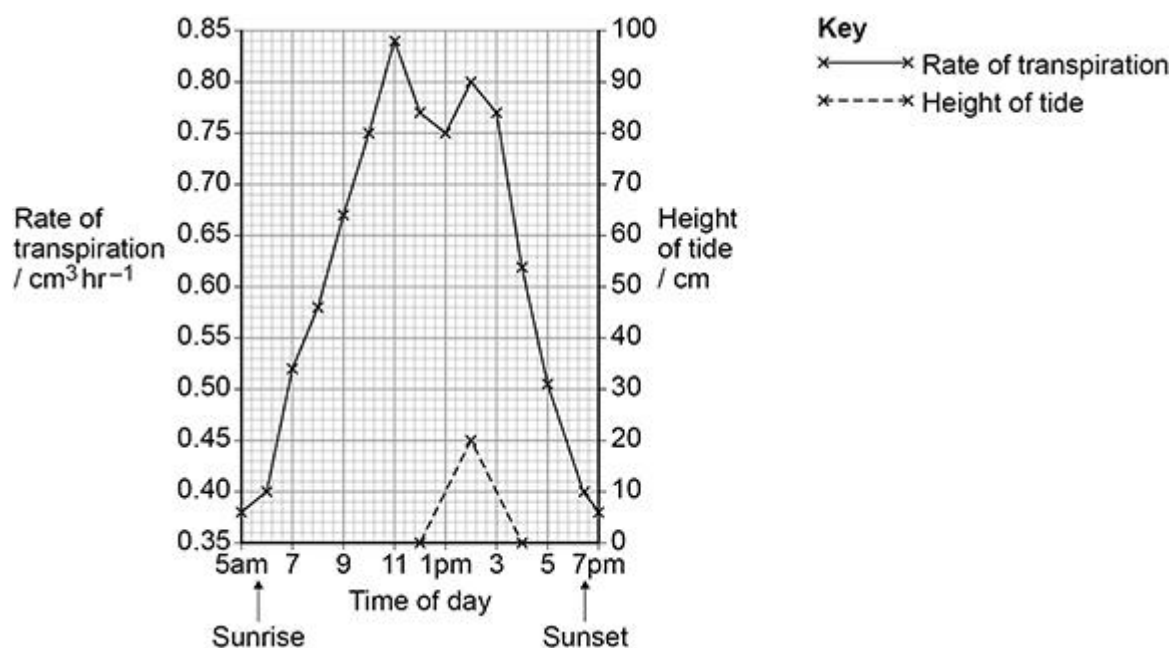
Time : 19 Minutes

Q1.

Mangrove trees grow near the sea. Sea water surrounds the lower parts of the trees at high tide.

Scientists investigated the rate of transpiration in a mangrove tree.

The figure below shows the scientists' results.



(a) Explain the rate of transpiration between 5 am and midday shown in the figure above.

(4)

- (2)**

- Describe an experiment that you could do to investigate whether the mangrove root cells have a lower water potential than sea water.

- a piece of fresh mangrove root
- sea water
- access to laboratory equipment.

(4)

Downloaded from www.merit-minds.com

Q2.

A student prepared a stained squash of cells from the root tips of garlic to calculate a mitotic index. He:

1. cut the end 5 mm from 10 garlic roots
2. placed the root tips into a Petri dish containing 5 cm³ of hydrochloric acid for 12 minutes
3. rinsed the root tips in distilled water
4. placed one of the root tips on a microscope slide and added toluidine blue stain
5. placed a coverslip onto the microscope slide, and gently pressed the coverslip downwards on the root tip
6. observed the root tip using an optical microscope.

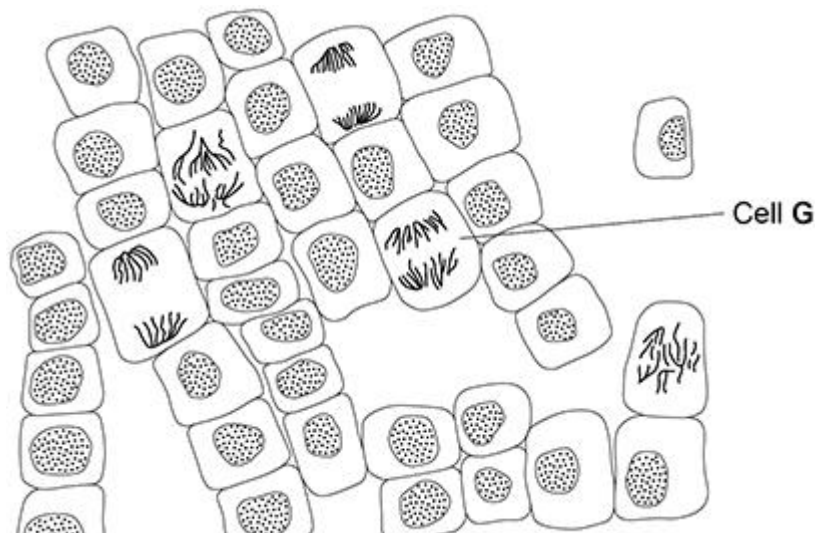
- (a) Suggest why the student soaked the root tips in hydrochloric acid in step 2.

(2)

- (b) Pressing the coverslip downwards enabled the student to observe the stages of mitosis clearly. Explain why.

(2)

The diagram below shows the student's drawing of one field of view.



- (c) Name the stage of mitosis shown in cell **G**. Explain the appearance of this cell.

Stage of mitosis _____

Explanation _____

(2)

- (d) Use the diagram above to calculate a mitotic index for the cells in this field of view.

Mitotic index _____

(1)

- (e) Other students in the class followed the same method, but calculated different mitotic indices.

Apart from student errors, suggest **two** explanations why.

1 _____

2 _____
