

- 7 The photograph below shows a coconut palm tree. These trees often grow on beaches near the sea. They can grow to a height of 25 metres.

The seedpod produced by the coconut tree has a thick fibrous husk that protects the seed from damage when it falls. This husk contains two types of fibre, white coir fibres and brown coir fibres.



Magnification $\times 0.003$

- (a) A student determined the mean tensile strength of white and brown coir fibres. The table below shows the mean tensile strength for the fibres and the ranges of the data.

Type of fibre	Length of fibre / mm	Tensile strength / MPa
White coir	5	192 ± 37
White coir	35	162 ± 32
Brown coir	5	343 ± 36
Brown coir	35	186 ± 55



- (i) Using the data in the table, identify which type of fibre shows the lowest percentage variability in tensile strength.

Place a cross ☒ in the box next to the correct conclusion that can be drawn from the results shown in this table

(1)

- ☐ **A** long brown fibre
- ☐ **B** long white fibre
- ☐ **C** short brown fibre
- ☐ **D** short white fibre

- (ii) The student concluded that brown coir fibres are stronger than white coir fibres.

Use the information in the table to comment on the validity of her conclusion.

(4)

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(b) Fibre cells in coir have a similar structure to sclerenchyma fibres.

(i) Suggest how the structure of the coir fibres makes them light, waterproof and strong.

(3)

(ii) White coir fibres are more flexible than brown coir fibres. Suggest how their structure may account for this difference in flexibility.

(1)

(Total for Question 7 = 9 marks)

