A level Biology A

H420/03 Unified biology

Question Set 8

1 The onion plant, *Allium cepa*, is grown as a food crop around the world.

(a) The table below contains statements about the root cells of an onion.

Place ticks (✓) in the boxes in the table to indicate whether the statements are true or false.

Statement about onion root cells	True	False
contain chloroplasts		
contain mitochondria		
contain 70S ribosomes in the cytoplasm		
have pili		
have cellulose cell walls		

[2]

(b) Fig. 1 shows a cross section of the root of an onion plant.

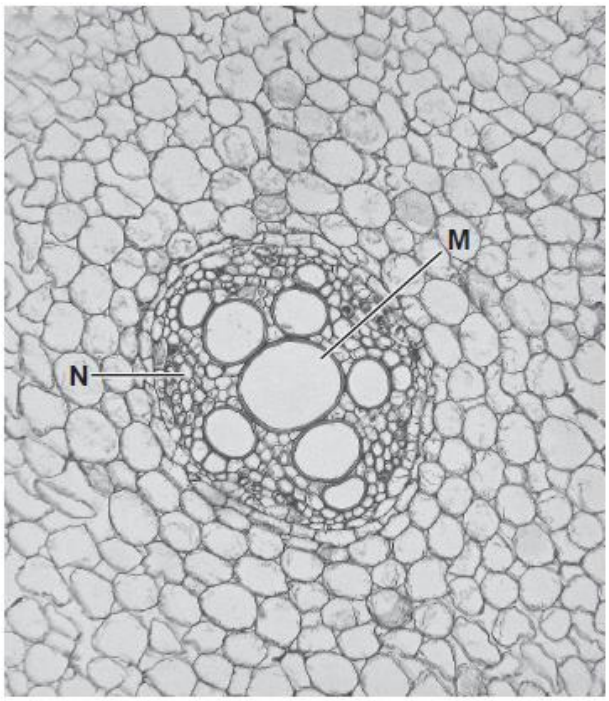

Fig. 1

Identify the **tissues** shown at **M** and **N**.

M .....

N .....

[2]

(c) The colour of onion bulbs is determined by two genes, **A/a** and **B/b**.

- **A** is a dominant allele and codes for the production of a red pigment.
- Onion bulbs that are homozygous for the recessive allele, **a**, produce no pigment and are white.
- **B** is a dominant allele that inhibits the expression of allele **A**.
- The recessive allele, **b**, allows the production of the red pigment.

A white onion plant was cross-pollinated with a red onion plant. All 15 offspring had the genotype **AaBb**.

(i) Identify the following:

The genotype of the white onion plant .....

The genotype of the red onion plant .....

The phenotype of the offspring ..... **[3]**

(ii) State the type of gene interaction shown by the genes **A/a** and **B/b**. **[1]**

(iii) Suggest how allele **B** inhibits the expression of allele **A**. **[2]**

Total Mark for Questions Set 8: 10