

A level Biology A
H420/03 Unified biology

Question Set 3

- 1 Tigers, *Panthera tigris*, are predatory mammals. They have evolved striped patterns on their fur, as shown in Fig. 3.1a, which provide camouflage in their habitats.



Fig. 3.1a

- (a) (i) Adaptations can be divided into three types.

State the type of adaptation represented by the tiger's stripes. [1]

- (ii)* Describe and explain how a tiger with striped fur may have evolved from a non-striped ancestor.

In your answer you should discuss the different types of genes that might be involved in the creation of the striped pattern in the tiger's fur. [6]

- (b) One subspecies of tiger is the Bengal tiger. One in 10000 Bengal tiger births results in a white Bengal tiger.

White Bengal tigers, as shown in Fig. 3.1b, have black stripes but lack orange fur.



Fig 3.1b

The allele that causes white fur is recessive and is a result of a mutation to a gene called SLC45A2.

According to the Hardy-Weinberg principle, the following equations can be used to estimate allele frequency within a population:

$$p^2 + 2pq + q^2 = 1$$

$$p + q = 1$$

Use the Hardy-Weinberg equations to calculate the percentage of Bengal tigers that are heterozygous for the SLC45A2 gene.

Give your answer to **one** significant figure.

Show your working.

Answer: % **[3]**

Total Mark for Questions Set 3: 10



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