2001 HIGHER SCHOOL CERTIFICATE EXAMINATION

Biology

Section I – Part B (continued)

Marks

Question 22 (6 marks)

(a) Cloning is a technique that could be used to increase numbers in an endangered species. What effect would cloning have on the genetic diversity of the species? **2**

cloning is making an exact identical genetic copy of an organism. Through the use of this technique on endangered species cloning would result in ~~all~~ most members of the species having the same genitic material thus decreasing the variety and genetic diversity of the species.

(b) Explain TWO possible evolutionary effects of a disease entering an endangered population containing some cloned individuals. **4**

If a disease entered a population ~~of~~ containing cloned individuals and they had no natural resistance to it, it would cause large amounts of deaths in the ~~members~~ cloned members of the population, as being genitically identical, their is no ~~varied members~~ variation between mem who could pass on resistance to offspring thus the ~~species~~ cloned Individuals might die out.

Where as if a disease entered a population where cloned individuals had genetic resistince to the disease, they would have a survival advantage over the other members who weren't cloned. Thus the cloned animals would survive + reproduce. But this would create other genetic problems as they are all genitically identical, ↓ variation in the long term.

Marks

Question 23 (3 marks)

In twelfth-century China, people seeking protection from smallpox removed scabs from people mildly scarred from the disease. These scabs were then ground and inhaled as powder. Similarly, in the seventeenth century, an Englishwoman, Mary Montagu, injected bits of smallpox scabs into healthy children to protect them from the disease. **3**

In the light of our current knowledge about the immune response, explain why these practices were successful.

These practices were effectively primative forms of immunization. Smallpox antigens were injected into people. These antigens would produce antibodies to the smallpox virus. These antibodies would remain in the body and produce immunity. When the person did contract smallpox the antigen was 'remembered' by the memory T-cells and the smallpox was easily fought off.

Question 24 (4 marks)

Explain the relationship between the cause and ONE symptom of ONE named non-infectious disease. **4**

Haemophilia is caused by the absence of the gene that is responsible for the clotting of blood. The gene is carried on the X chromosome and is sex linked. When there is no corresponding gene to counteract this absence haemophilia is present in the person. As a result of this absence the person has blood that doesn't clot properly leading to spontaneous bleeding or bleeding from slight bumps and cuts, which are a symptom of the deficency of the blood clotting gene.