32. a

Variation (1 mark). Members of a population of a species all vary from one another (1 mark).

Isolation (1 mark). A physical or socio/cultural separation of members of the group(1 mark). They can no longer mate with each other and exchange alleles (1 mark).

Selection (1 mark). The separated groups are exposed to different environmental conditions (1 mark) so different characteristics are selected for (1 mark). As a result of this frequency of alleles starts to differ between the separated groups (1 mark).

Speciation (1 mark). Eventually the two groups become so genetically different that they can no longer intermate to produce viable (fertile) offspring (1 mark).

Up to 10 marks.

b.

I. Polygenetic inheritance(1 mark). Here two or more genes control one characteristic(trait) (1 mark).

Male female

II. Parent genotype= aaaaaa x AAAAAA(1 mark)

Possible gametes sperm egg

AAA aaa (1 mark)

|  |  |
| --- | --- |
|  | aaa |
| AAA | AaAaAa |

(1 mark)

Genotypes 100% AaAaAa(1 mark)

Phenotype 100% AaAaAa(1 mark)

III. Parent genotype= male female

AA OO(1 mark)

Gamete sperm eggs

A O(1 mark)

|  |  |
| --- | --- |
|  | O |
| A | AO |

(1 mark)

Genotype 100% AO(1 mark)

Phenotype 100% A(1 mark)

All of the offspring could donate blood to their father. (1 mark)

Up to 5 marks.

IV. Mutation.

c.

I. cornea of the eyes, kidney, heart, liver, lung, skin. (0.5 each mark). Maximum 2 marks.

II. Rejection of transplanted tissue(1 mark). The recipient’s immune system identifies the tissue as being foreign and attacks it(1 mark).

III. Tissue matching(1 mark). Immunosuppressant drugs(1 mark).

IV. Transgenic(1 mark).