Higher Combined version — Higher Tier (★) included; Separate-only (◆) removed.

Q1. Define: (a) dominant allele, (b) recessive allele, (c) homozygous, (d) phenotype.

[4 marks]

Q2. Brown eyes (B) are dominant to blue eyes (b). Two heterozygous parents (Bb × Bb) have a child. Use a Punnett square to predict the probability the child has blue eyes.

[3 marks]

Q3. Explain the difference between genotype and phenotype. Give ONE example to illustrate your answer.

[3 marks]

★ HIGHER TIER

Q4. ★ Explain what co-dominance is. Give ONE example.

[3 marks]

Total: 13 marks

Q1 (4 marks)

Define: (a) dominant allele, (b) recessive allele, (c) homozygous, (d) phenotype.

- (a) Expressed when only one copy present — masks recessive [1]
- (b) Only expressed when two copies present (homozygous recessive) [1]
- (c) Having two identical alleles for a gene (BB or bb) [1]
- (d) The observable characteristic produced by the genotype [1]

Q2 (3 marks)

Brown eyes (B) are dominant to blue eyes (b). Two heterozygous parents (Bb × Bb) have a ch…

- Punnett square: BB, Bb, Bb, bb [1]
- 1 in 4 / 25% probability of blue eyes (bb) [1]
- Phenotype ratio: 3 brown : 1 blue [1]

Q3 (3 marks)

Explain the difference between genotype and phenotype. Give ONE example to illustrate your…

- Genotype: the actual alleles an organism carries (e.g. Bb) [1]
- Phenotype: the observable characteristic produced by those alleles (e.g. brown eyes) [1]
- A heterozygote (Bb) has a brown eye PHENOTYPE even though it carries a blue eye allele [1]

Q4 (3 marks) [★ HT]

★ *Explain what co-dominance is. Give ONE example.*

- Co-dominance: both alleles expressed equally in the phenotype — neither dominates [1]
- Example: ABO blood group: I■ and I■ are co-dominant — genotype I■ I■ gives blood group AB [1]
- Sickle cell trait: HH■ individual has both normal and sickle haemoglobin [1] — accept either example