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

Q1. Explain why meiosis is essential for sexual reproduction. Describe how it generates variation.

[4 marks]

★ HIGHER TIER

Q2. ★ Describe the two stages of protein synthesis.

[4 marks]

Total: 8 marks

Meiosis (3.1–3.3)

Q1 (4 marks)

Explain why meiosis is essential for sexual reproduction. Describe how it generates variat…

- Produces haploid gametes (23 chromosomes) — fertilisation restores diploid (46) [1]
- Crossing over: DNA exchanged between homologous chromosomes → new allele combinations [1]
- Independent assortment: random distribution of chromosomes → unique gametes [1]
- Combined with fertilisation → offspring are genetically unique [1]

Q2 (4 marks) [★ HT]

★ Describe the two stages of protein synthesis.

- Transcription (nucleus): DNA template → mRNA, A-T C-G U pairs (U replaces T) [1]
- mRNA leaves nucleus through nuclear pores [1]
- Translation (ribosome): codons (3 bases) read; tRNA brings specific amino acids [1]
- Peptide bonds join amino acids → polypeptide assembled [1]