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

Q1. Describe the cell cycle. Explain what happens at each stage.

[4 marks]

Q2. Compare embryonic and adult stem cells. Evaluate the use of embryonic stem cells in medicine.

[4 marks]

★ HIGHER TIER

Q3. ★ Explain how cancer results from failure of normal cell cycle control.

[3 marks]

Total: 11 marks

Q1 (4 marks)

Describe the cell cycle. Explain what happens at each stage.

- G1 (interphase): cell grows, new organelles made [1]
- S phase: DNA replicates [1]
- G2: cell checks DNA, prepares for division [1]
- M (mitosis): chromosomes separate; cytokinesis → 2 identical diploid daughter cells [1]

Q2 (4 marks)

Compare embryonic and adult stem cells. Evaluate the use of embryonic stem cells in medici…

- Embryonic: totipotent; adult: limited range [1]
- Embryonic: could treat many diseases by providing any cell type [1]
- Concern: destroying embryo raises ethical issues [1]
- Risks: immune rejection, possible tumour formation [1]

Q3 (3 marks) [★ HT]

★ *Explain how cancer results from failure of normal cell cycle control.*

- Mutations in genes controlling cell cycle checkpoints [1]
- Cells no longer respond to stop signals → divide uncontrollably [1]
- Malignant tumour: cells invade surrounding tissue, can metastasise via blood [1]