

Question 20 (Answer: C)

- Telomeres are the ends of the DNA molecules, so they can only shorten when the DNA is copied.
- DNA replication happens in the S phase of interphase.
- G1 and G2 are growth phases and cytokinesis divides the cytoplasm.

Question 21 (Answer: B)

- Telomeres are the protective ends of *linear* chromosomes.
- Animal and plant cells both have linear chromosomes in a nucleus, so both have telomeres.
- A typical bacterial chromosome is circular, so it has no ends and no telomeres.

Question 21 (Answer: D)

- Adult stem cells divide by mitosis to replace worn-out cells in a tissue.
- They are multipotent, so they can only form a limited range of cell types.
- They cannot form a whole new organism – that needs a totipotent cell.

Question 22 (Answer: D)

- DNA replicates in interphase, not during mitosis itself, so statement 1 is wrong.
- Mutations can and do occur between generations of cells, so statement 2 is wrong.
- Mitosis produces genetically identical daughter cells, so statement 3 is right.

Question 19 (Answer: C)

- DNA content doubles during the S phase of interphase, so the rising section is replication.
- The nuclear envelope breaks down in prophase, once the DNA content is already doubled.
- The DNA content halves at cytokinesis, when the two daughter cells separate.

Question 20 (Answer: D)

- Follow the branching: the cells that keep dividing are the stem cells.
- The cells that stop dividing have differentiated into a specialised type.
- Bone marrow contains adult stem cells that produce specialised blood cells.