The mitotic cell cycle – AS 9700 Biology June 2022

1. June/2022/Paper_11/No.18

Which processes require mitosis?

1 the cloning of T-lymphocytes

2 the repair of cell structures by protein synthesis

3 the growth of multicellular organisms from a single cell

4 the reproduction of a unicellular eukaryote

A 1, 2 and 3 **B** 1, 3 and 4 **C** 1 and 2 only **D** 3 and 4 only

2. June/2022/Paper_11/No.19

Which events listed are part of the cell cycle?

1 interphase

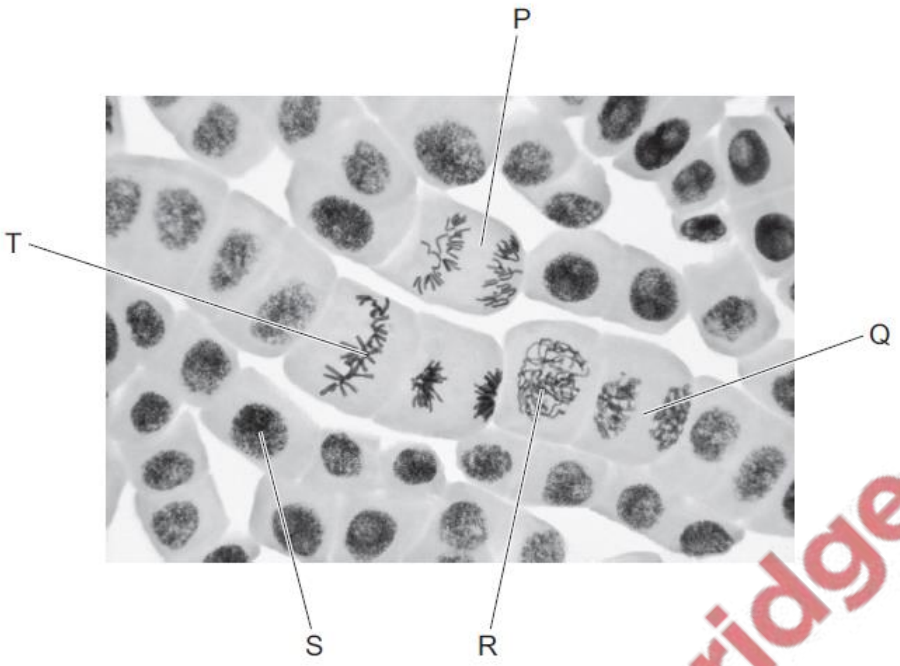
2 prophase

3 cytokinesis

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

3. June/2022/Paper_11/No.21

The photomicrograph shows cells at different stages of mitosis.



A student wrote four statements about the photomicrograph.

1 Cell P shows anaphase.

2 Spindle formation is occurring in cell Q.

3 The amount of DNA in cell R is the same as in cell T.

4 The correct order for the stages is S → R → T → P → Q.

Which statements are correct?

A 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

4. June/2022/Paper_12/No.17

What is a role of mitosis?

A growth of organisms

B production of genetically different cells

C repair of cells

D replacement of cancerous tissue

5. June/2022/Paper_12/No.18

Telomeres prevent the loss of genes from the ends of chromosomes during DNA replication, but they become shorter each time they are copied.

In cancer cells and stem cells, the telomeres remain the same length.

Which statement is correct for **all** human cells?

A If telomeres become too short, a cell may stop dividing.

B Adding telomeres could increase the rate of ageing of cells.

C Telomeres are repaired by the enzyme RNA polymerase.

D Telomeres prevent all damage occurring to DNA molecules.

6. June/2022/Paper_12/No.19

The nucleus of a mouse body cell in G_1 phase of the cell cycle has 1.2×10^{-12} g of DNA.

What will be the mass of DNA in the nucleus of the cell at the end of S phase and at the end of G_2 phase of the cell cycle?

	end of S phase	end of G_2 phase
A	1.2×10^{-12} g	1.2×10^{-12} g
B	1.2×10^{-12} g	2.4×10^{-12} g
C	2.4×10^{-12} g	1.2×10^{-12} g
D	2.4×10^{-12} g	2.4×10^{-12} g

7. June/2022/Paper_12/No.20

Which statement about telomeres is correct?

A They allow cells in culture from any age of donor to divide a fixed number of times.

B They are genes which are present on the 5′ end of every chromosome.

C They are unpaired regions of DNA on the 3′ end of every chromosome.

D They prevent introns and exons being lost from genes during cell division.

8. June/2022/Paper_13/No.18

Some cells are listed.

1 bacterial cells

2 cancer cells

3 lymphocytes

4 mature red blood cells

5 stem cells

Which cells can divide by mitosis?

A 1, 2, 4 and 5

B 1, 2 and 3

C 2, 3 and 5

D 3, 4 and 5

9. June/2022/Paper_13/No.19

Which statements about mitosis are correct?

1 At the end of telophase, two nuclei are formed.

2 Centrioles attach chromosomes to the spindle during metaphase.

3 Chromatids are pulled apart during anaphase.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

10. June/2022/Paper_13/No.20

Which statement about telomeres is correct?

A They allow cells in culture from any age of donor to divide a fixed number of times.

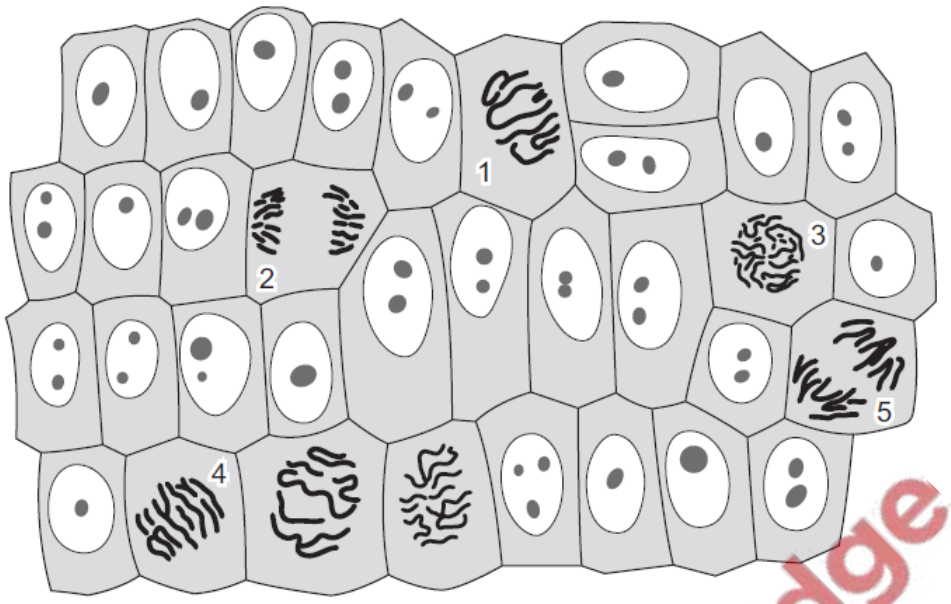
B They are genes which are present on the 5′ end of every chromosome.

C They are unpaired regions of DNA on the 3′ end of every chromosome.

D They prevent introns and exons being lost from genes during cell division.

11. June/2022/Paper_13/No.21

The diagram shows stages of mitosis.



What is the correct sequence of the stages of mitosis numbered on the diagram?

A 1 → 3 → 4 → 2 → 5

B 1 → 3 → 4 → 5 → 2

C 3 → 1 → 4 → 5 → 2

D 3 → 4 → 1 → 2 → 5