

INDIAN SCHOOL NIZWA
CLASS XI SUB: BIOLOGY
CH- CELL CYCLE AND CELL DIVISION. Worksheet.

CASE BASED QUESTIONS.

Q1. The sequence of events by which a cell duplicates its genome synthesises the other constituents of the cell and eventually divides into two daughter cells is termed cell cycle. Cell cycle is divided into interphase and M phase. In the interphase, though called the resting phase, cell is preparing for division by undergoing both cell growth and DNA replication. Interphase is divided into three phases- G₁ phase, S phase and G₂ phase. In G₁ phase, cell prepares proteins and enzymes. In S phase, DNA replication and centriole duplication take place. After S phase, chromosome number of the cell does not change but the amount of DNA becomes double (4C). In G₂ phase, synthesis of protein especially tubulin, which is used in the formation of spindle fibres, occurs. During M phase, cell division occurs through karyokinesis and cytokinesis.

- i) How many chromosomes and DNA content will the onion cell have in G₁ phase, after completing S phase and after M phase respectively, if onion plant possesses 14 chromosomes initially?
 - ii) Non-dividing cells like neurons enter into a particular phase in the cell cycle. Explain
 - iii) Name the phase in which de-condensation of chromosomes takes place.
 - iv) During nuclear divisions like mitosis, what happens to the DNA of plastids and mitochondria?
 - v) Which cell division is concerned with cancer?
 - vi) At what point during meiosis does genetic material cross over?
2. Anaphase is the stage of mitosis where sister chromatids separate and move to opposite poles of the cell. During anaphase, enzymes break down the proteins holding the sister chromatids together, and spindle fibers pull the now-independent daughter chromosomes towards the poles. This ensures that each of the two future daughter cells will receive a complete and identical set of chromosomes.
- i) What is the difference between anaphase of mitosis and anaphase of meiosis?
3. Discuss the various stages of cell cycle with a neat and labelled diagram.