

**CLASS – X**  
**LIFE SCIENCE**

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**Theme: Continuity of Life**

**Sub-theme: Cell Division and Cell Cycle**

**1. What is the importance of cell division in living organisms?**

**Ans.** The main importance of cell division in living organisms are —

- i) **Growth:** As a result of mitotic cell division the somatic mother cell produces somatic cells. So the growth of various organs occur which leads to the growth of living organisms.
- ii) **Development of zygote:** Through mitotic division unicellular zygote is transformed into multicellular embryo.
- iii) **Reproduction:** Unicellular organism reproduces by cell division.
- iv) **Repair:** New cells develop as a result of cell division which helps in healing the injured regions of the body.
- v) **Evolution:** As a result of meiosis new character develops within a species which leads to variation and eventually evolution occurs.

**2. Describe the process of amitosis.**

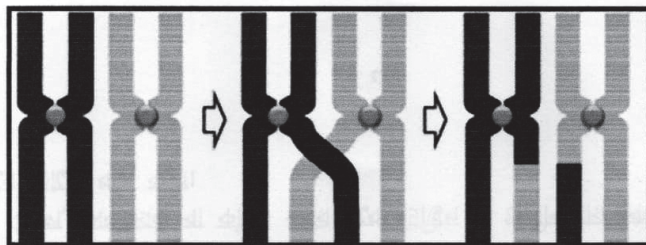
**Ans.** At the beginning of amitosis the cell becomes elongated and a constriction appears at the middle of the cell. Nucleus also elongates and assumes a dumbbell shape. Following this, the cell along with cytoplasm also assumes a dumbbell shape. As the constriction moves inward from both side it divides the cytoplasm and nucleus. As a result two daughter cells are formed. Amitosis cell division occurs in this way.

**3. What is bivalent or diad?**

**Ans.** During Zygotene stage of Prophase-I of meiosis, the paired homologous chromosomes are called bivalents or diads.

**4a. When and how do crossing over and chiasma occur?**

**Ans.** During Pachytene - I of meiosis, the mutual exchange of segments or genetic materials takes place between the non-sister chromatids of homologous chromosomes known as crossing over.



**Fig: Crossing Over**

**4b. How do new characteristics appear due to crossing over?**

**Ans.** Due to crossing over reshuffling of genetic materials coming from parental chromosomes takes place. It leads to the formation of new characteristics or variation that is essential for organic evolution.

**5. What is the role of centromere during anaphase?**

**Ans.** During anaphase, the chromosomes transform into sister chromatids. The centromeres of the sister chromatids or daughter chromosomes remain attached to the spindle fibres. The separated chromatids exhibit polar movement due to the contraction of spindle fibres.