KAGZI · ORIGINAL STUDY SERIES

STUDY BOOK 05 · ENGLISH EDITION

General Science and Technology

Physics, Chemistry, Biology and Technology

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Initial edition · Chapter-wise expansion in progress

For UPPSC / UPSSSC, UPSC, SSC and Railway examination preparation.
This is an initial, chapter-wise edition. It does not claim to cover the complete syllabus. Check changing administrative and current-affairs facts against official sources before an examination.

About this book

Science requires an understanding of principles, experiments, causes and outcomes alongside factual knowledge. General science can be studied through physics, chemistry, biology and applied technology.

Chapter 01 · The Cell: Basic Unit of Life

Learning objective: *Understand basic concepts, identify key terms and answer factual as well as conceptual examination questions.*

1. Concept of the Cell

The cell is the basic structural and functional unit of living organisms. Unicellular organisms consist of one cell, whereas multicellular organisms have many cells that perform specialised functions. Cell theory states that all living organisms are made of cells and that new cells arise from pre-existing cells.

2. Cell Membrane and Cytoplasm

The cell membrane is selectively permeable and regulates the movement of substances. The cytoplasm contains various cell organelles. The nucleus contains genetic material and plays a role in regulating cellular activities.

3. Major Cell Organelles

Mitochondria are associated with cellular respiration and ATP production. Ribosomes carry out protein synthesis. In plant cells, chloroplasts perform photosynthesis. Vacuoles help store water and other substances.

4. Plant and Animal Cells

Plant cells generally have a cell wall, plastids and a large central vacuole. Animal cells do not have a cell wall. Both types share structures such as the cell membrane, cytoplasm and ribosomes.

Quick Revision

- Cell: basic structural and functional unit of life
- Mitochondria: ATP production
- Ribosomes: protein synthesis

Practice and Self-Assessment

What is the basic structural and functional unit of life?

Answer and explanation: The cell.

Which organelle is associated with ATP production?

Answer and explanation: Mitochondria.

Where does protein synthesis take place?

Answer and explanation: At ribosomes.

Sources and further study

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