7th FB Module Exercise Solutions

Objective Questions

1. (d) Electron microscope was invented by Knoll and Ruska.
2. (b) The outer living membrane of the plant cell is cell membrane as it selects and allow only specific substances to move in and out of the cell.
3. (c) The smallest cell is *Mycoplasma* (a bacterium) about 0.1 micron in diameter.
4. (b) Cell organelle involved in photosynthesis in plants is chloroplast. It has chlorophyll pigments which help in capturing light during photosynthesis.
5. (c) SER helps in the synthesis of steroids and lipids.
6. (a) Golgi body is absent in blue green algae (*Cyanobacteria*) as it is a prokaryote and membrane bound cell organelles are absent in all prokaryotes.
7. (c) Chloroplast and chromoplast are two types of plastids having green and other colour pigments except green respectively. Green tomatoes turn red due to the conversion of chloroplast into chromoplast.
8. (d) Lysosome was discovered by Christian de Duve.
9. (a) ER is lie as a network of tubules in the cytoplasm of the cell, thus works as cytoskeleton of the cell.
10. (a) Ribosome is the cell organelle that lacks a membrane.
11. (d) The infoldings of the inner membrane of the mitochondria are called cristae that help to increase the surface area of the inner membrane so that more ATP synthase enzyme can be present in the mitochondria.
12. (b) *Amoeba* is the unicellular organism which does not have any fixed shape.
13. (c) The units are organised in the following manner within living organisms:
    Cells – Tissues – Organs – Organ System
14. (c) The protoplasm is the living part of the cell which consists of nucleus and cytoplasm.
15. (d) Mitochondria is also known as the power house of the cell because it is the site of ATP (energy currency) generation in our body.

Subjective

1. Anton Van Leeuwenhoek – Father of Microscopy
   → discovered living cell and he called them "animalcules". He also improved the microscope and laid foundation for microbiology. He is often cited as the first microbiologist to study muscle fibers, bacteria, spermatozoa and blood flow in capillaries.
2. Unicellular Plants – *Chlamydomonas* and *Chlorella*
   Unicellular Animals – *Amoeba* and *Paramecium* (animal like protists)
3. In mitochondria, energy is produced in the form of ATP (Adenosine triphosphate – energy currency of the body).
4. Viruses can be considered to be alive as they reproduce, however the cell theory states that all living things have cells as their fundamental unit of structure. A virus is not made up of cell. But it is considered to be living.
   Therefore it is an exception to the cell theory.
5. The cell theory was proposed by Schleiden (1838) and Schwann (1839).

6. The cell membrane is the living membrane in any cell as it selects and allows only specific substances to move in and out of the cell (selectively semi-permeable membrane).
7. The protoplasm is the living part of the cell which consists of nucleus and cytoplasm.
8. The cell was discovered by Robert Hooke (1665).
9. Lysosomes contain powerful digestive enzymes which are capable of breaking down foreign food particles or microbes entering the cell. Sometimes lysosome can burst, releasing these enzymes into the cell and cause destruction of the damaged or injured cell. Hence, also known as 'suicidal bags of the cell'.
10. The human eye cannot see most cells without the aid of the microscope. Microscopes provide magnification that allows people to see individual cells.
11. Important functions:
    Nucleus – contains genetic material (DNA) and regulates al the activities of the cell.
    Plastid - Chloroplast – traps solar energy and thus helps in photosynthesis.
    Chromoplast – provides colour to fruits and flowers.
    Leucoplast – storage of food (like starch, protein, fat).
    Mitochondria – helps in cellular respiration by producing energy (ATP).
    Lysosome – engulf pathogen (disease causing organisms) and remove dead cells.
12. Refer page no. 11.
13. Refer page no. 11.
14. Discovery:
    Living cell – Antony Van Leewenhoek
    Nucleus – Robert Brown
    Golgi apparatus – Camillo Golgi
    Cell theory – Schleiden and Schwann
    Microscope - Antony Van Leewenhoek