

GENERAL SCIENCE AND ABILITY

<b>TIME ALLOWED: THREE HOURS</b>	<b>PART-I (MCQS)</b>	<b>MAXIMUM MARKS = 20</b>
<b>PART-I(MCQS): MAXIMUM 30 MINUTES</b>	<b>PART-II</b>	<b>MAXIMUM MARKS = 80</b>

**NOTE:**

- **Part-II is to be attempted on the separate Answer Book.**
- **Attempt ONLY FOUR questions from PART-II by selecting TWO questions from EACH SECTION. ALL questions carry EQUAL marks.**

**PART-II**  
**(SECTION-A)**

**No. 2**

- a. What is octet rule in chemical in chemical bonding? Explain covalent bond in detail.
- b. Why water molecule is angular in structure?
- c. Write a note on structure and functions of Human Brain.
- d. Describe the 'Cell Structure'. Write down the functions of at least three Subcellular Organelles.

**No. 3**

# SECTION-II

Q.d.

Ans:

Cell structure

Introduction

Cell is unit of structure and function of all living things. The word "cell" is derived from "cellula" which means a "little room".

Cells are often divided into particular groups based on major characteristics.

One such division separates cells into two groups: **Prokaryotic** and **eukaryotic cells**

Cell organelles

Common organelles include:

- Endoplasmic reticulum
- Ribosomes
- Lysosomes
- Golgi apparatus
- Mitochondria
- Nucleus

Mitochondria

Introduction: Mitochondria are very important organelles. They are present

only in Eukaryotic cells. They are involved in manufacturing of and supply of energy.

## Structure of Mitochondria

- These are vesicle rod or filament shaped.
- Mitochondria are bounded by two membranes. The outer membrane is smooth.
- The inner membrane forms many foldings called cristea. The inner surface of cristea contains small knob like structures, called F<sub>1</sub> Particles.

## Composition of Mitochondria,

The Mitochondrial membranes have similar composition and structure as other membranes.

- They are composed of lipids and proteins.
- The mitochondria contains matrix of large number of enzymes, Coenzymes, organic and inorganic salts.
- It also contains DNA and Ribosomes.

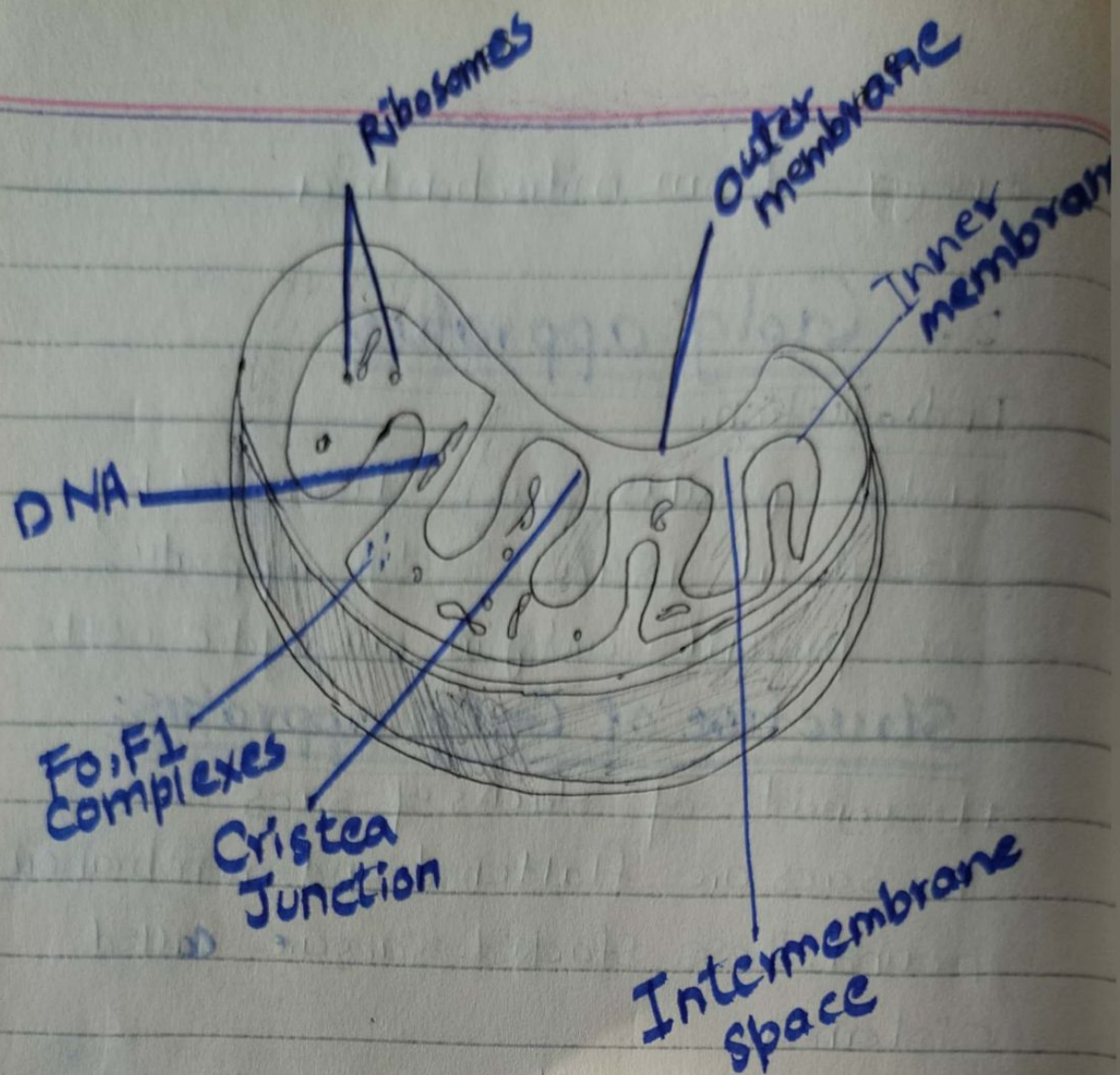


Fig: Structure of Mitochondria

Functions of Mitochondria:

- Many important metabolic processes take place in mitochondria. These are Krebs cycle, aerobic respiration, fatty acids metabolism etc. Energy is released from organic food. This energy is transferred to energy rich compound ATP. ATP provides energy to cell on demands and ATP is broken to ADP. The ADP absorbs

energy from mitochondria.

## 2. Golgi apparatus

### Introduction.

Golgi apparatus was discovered by Golgi in 1898. Golgi apparatus are present only in eukaryotic cells.

### Structure of Golgi apparatus:

It consists of stacks of sacs.

The sacs are flattened and membranous bound. These stacked sacs are called cisterna.

The cisterna with associated vesicles are called Golgi apparatus. The Golgi complex system of interconnected tubules is present around central stacks.

### Function of Golgi apparatus:

The functions are following.

1. Cell secretions: These are concerned with cell secretions. For instance, in mammals, the pancreas secretes granules. The granules contain enzymes that help in digestion.

- The ribosome's synthesis of proteins part of cell secretion.
- The endoplasmic reticulum transfers it to golgi complex.
- It converts the secretion of finished products. These secretions are packed inside the membrane to form granules.

