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**Faculty of agriculture Benha Univ.**

**Agricultural Botany Dep. Agricultural Biotechnology Program**

**Level one ( First semester 2015 / 2016 ) Course : Cell biology ( AB 0802 Selective )**

**model answer**

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**(15 M)**

**first question : ( Answer only two points ) The differences between for each of the following:**

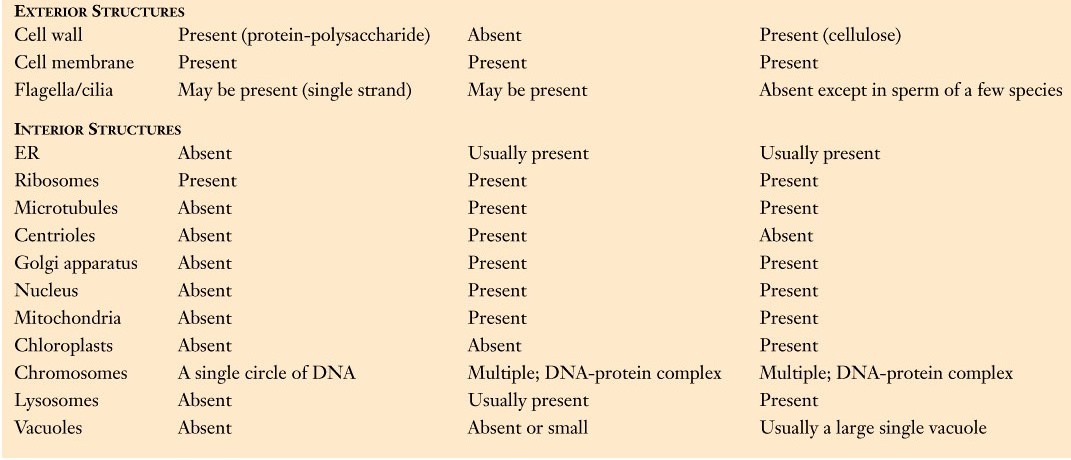
1. **Prokaryotic cell and eukaryotic cell.**

**Prokaryotic**

**Eukaryotic**

**Plant**

**Animal**



1. **Mitosis and meiosis divisions in plant cell.**

|  |  |
| --- | --- |
| **Differences between mitosis and meiosis** | |
| **Mitosis** | **Meiosis** |
| This type of division takes place in somatic cells. | This type of division takes place in gametic cells. |
| Two daughter cells are formed. | Four daughter cells are formed. |
| Number of chromosomes remains diploid in daughter cells. | Number of chromosomes becomes haploid in daughter cells. |
| Mitosis is necessary for growth and repair. | Meiosis is necessary for sexual reproduction. |
| Cross over does not take place. | Cross over take place. |

1. **Plant and animal cells.**

**Plant cell Animal cell**

Cell wall is present Cell wall is absent

Centrioles are absent Centrioles are present

Plastids are present Plastids are absent

Have large vacuole May have small vacuoles

**(15 M)**

**Second question : ( Answer only two points )**

1. Three functions for each of:

* **Cell wall :** Cell-wall performs following important functions.
  + 1. It provides a definite shape and strength to the cell.
    2. It protects plasma membrane and protoplasm from external shocks.
    3. It plays role in cell enlargement.
* **Nucleus :**

1. It is considered as apparatus of heredity :
2. It control heredity characters
3. It is center of vital activities in cells

* **Endoplasmic reticulum:**

1. It helps in intracellular transportation.
2. It provides mechanical support to cytoplasmic matrix.
3. A large surface area for enzyme action.

1. **The main principles of cell theory are :**
2. All living organisms are composed of cells and products of cells.
3. All cells arise from pre existing cells through the process of cell division.
4. The body of living organisms is made up of one or more cells.

**Definition of cell biology:** Cell Biology is a classical branch of biology that deals with the study of structure, function and life history of a cell .

1. **The types of:**

**- Microbodies:** The microbodies of cell can be classified into different groups on the basses of their structure, location and functions: these are as follows

Peroxisomes - glyoxysomes - spherosomes - lysosomes

**- Plastids** : Plastids are classified into three types based on the type of pigments.

1. Chromoplasts: These are different coloured plastids containing carotenoids. These are

present in fruits, flower and leaves.

2. Leucoplasts: These are colourless plastids which store food materials.

Ex: Amyloplasts: Store starch Aleuronoplasts: Store proteins Elaeioplasts: Store lipids

3. Cholorplasts: These are green coloured plastids containing chlorophylls and carotenoids

(carotenes & xanthophylls).

**- Phases of mitosis division:** besides interphase four different phases: prophase - metaphase – anaphase – telophase

**- Karyokinesis:** The types of karyokinesis are:1-A mitosis 2- Mitosis 3- Meiosis

**(15 M)**

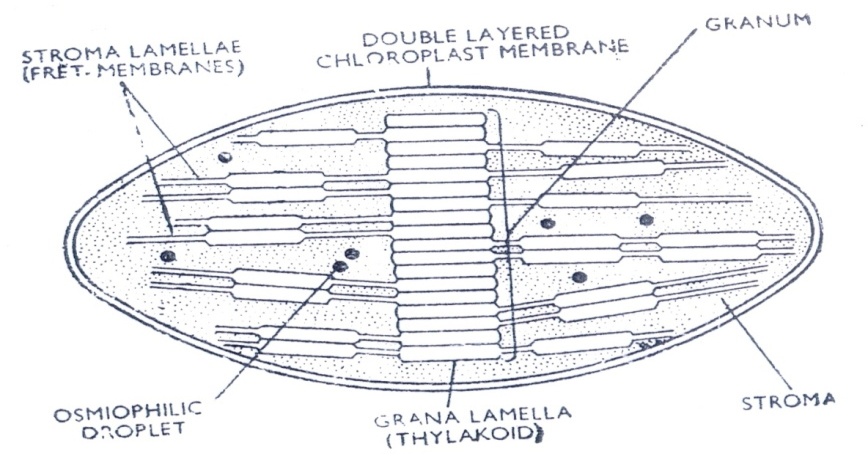
**Third question: (Answer only one point) illustrating with drawing the structure and function**

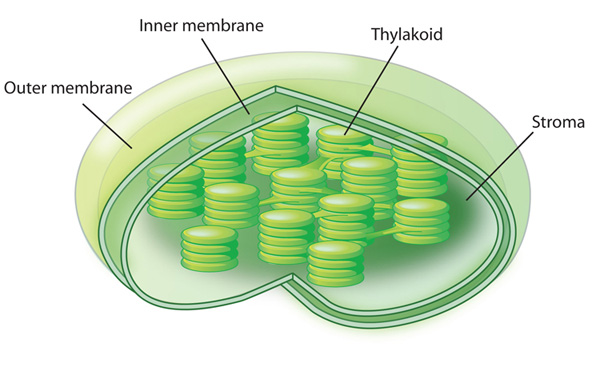
**for each of**:

**A**. Chloroplast - Plasma membrane model**.**

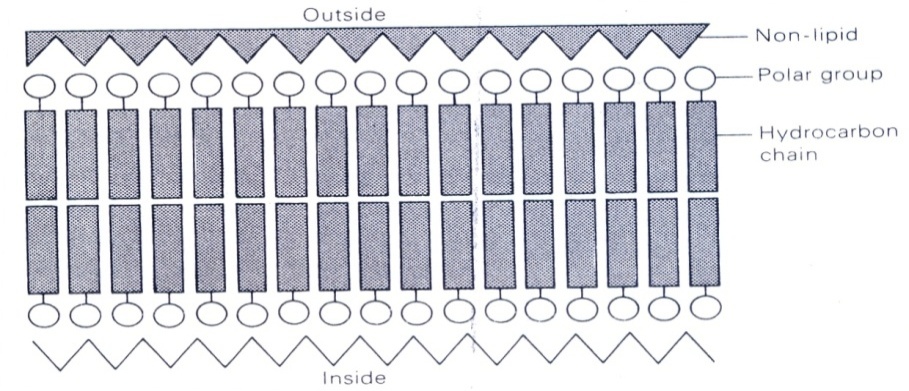
- The structure of chloroplast (with drawing)

* *Chloroplasts are larger and more complex than mitochondria*
* *Grana – closed compartments of stacked membranes*
* *Thylakoids – disc shaped structure – light capturing pigment*
* *Stroma – fluid matrix*
* *Double membranes*



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Functions of chloroplast:The most important function of chloroplast :

* Sits of photosynthesis : the process of photosynthesis includes a- light reaction (which takes place in grana ) b- dark reaction ( stroma)
* synthesis of starch , protein and fatty acids
* **Plasma membrane model** (with drawing)
* 



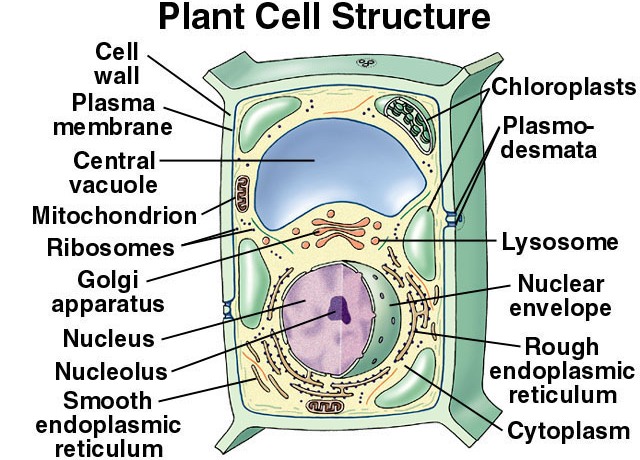
* **Functions of Plasma membrane**

1. It protect the cytoplasm
2. It maintains selective permeability
3. It regulates the movement of water and minerals
4. It helps in protein synthesis and excretion of waste materials
5. It acts as elements ; interaction between cells ;energy transformations in chloroplast and mitochondria ; all cytosoms originate from plasma membranes

**B.**

**- Mature plant cell (with drawing).**

1. The cell is a structural and functional unit of any living organism. Since, the body of living organisms is made up of one or more cells.



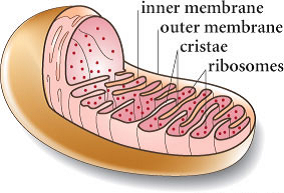
* **- Mitochondria (with drawing).**

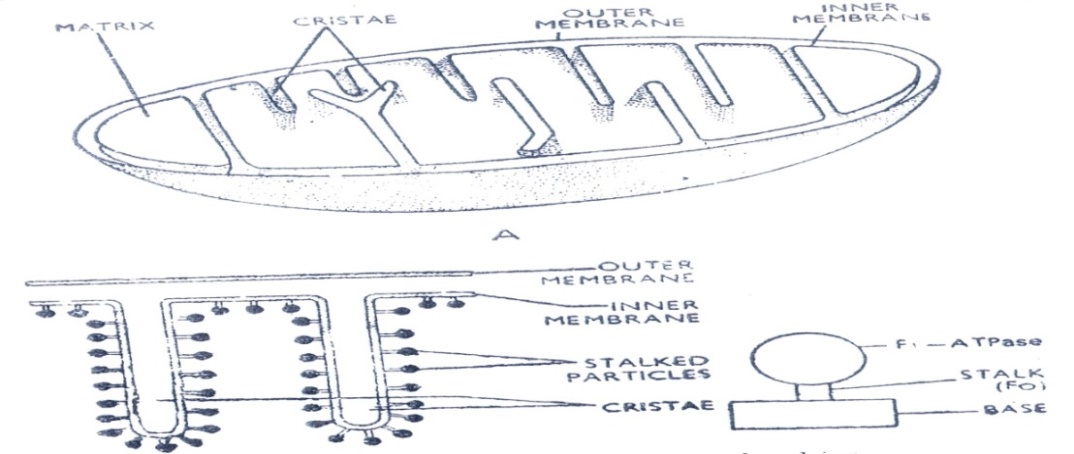
Mitochondrion is a spherical or rod shaped cell organelle. It has two membranes. The outer membrane is smooth. The inner membrane produces finger like infoldings called cristae. The inner membrane has stalked particles called ATP synthase complex. The mitochondrial cavity is filled with a homogenous granular mitochondrial matrix. The matrix has circular mitochondrial DNA, RNA, 70s ribosomes, proteins, enzymes and lipids.

* **Functions:**

Mitochondria synthesis and store the energy rich molecules ATP (Adenosine triphosphate)

during aerobic respiration. So, they are called “Power houses of the cell”.

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**Fourth question:**

**(15 M)**

**A- Choose the right answer for each of the following:**

1. The photosynthesis process is occurring in:
2. Leucoplasts **b) Chloroplasts** c) Mitochondria
3. Chemically the primary cell wall composed of

a) Protein b) Calcium pectate **c) Cellulose chains**

3- Which of the following are called suicidal bags of cell:

1. Ribosomes **b) Lysosomes**  c) Peroxisomes

4- Most of the physiological activities of living organelles of plant cells take place in:

a) Vacuoles b) Ectoplasm **c) Cytoplasm**

5- Separation of chromatids and chromatids move to opposite poles of the cell are occur in:

a) Telophase **b) Anaphase** c) Prophase

1. **Mark with (** √ **) or ( × ) for each of the following :**

1- The sites of protein synthesis of the cell occur in Glyoxysomes. ( **×** )

2- Spherosomes are surrounded by single membrane. ( √ )

3- Peroxisomes are associated with photorespiration . ( √ )

4- In plant cell, cell wall formation begins at the metaphase stage in mitosis during cell division. ( **×** )

5- The cell cycle is divided into two basic phases. ( √ )

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***Prof. Dr. Hosny Mohamed Abd El-Dayem Good luck***

***Professor and head of Agricultural Botany Dept.***

***Fac. of Agric., Benha Univ.***