

OBE SEMESTER EXAMINATION

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| Part | PROKARYOTIC CELL | EUKARYOTIC CELL |
|-----------------------|---|--|
| Type of cell | Always unicellular | Unicellular or multicellular |
| Cell size | 0.2 μm - 2.0 μm in diameter | 10 μm - 100 μm in diameter |
| Cell Wall | Usually present; chemically complex in nature. | When present, chemically simple in nature. |
| Nucleus | Absent (have a nucleoid region in cell instead). | Present |
| Ribosomes | Present. Smaller in size and spherical in shape. | Present. Comparatively larger in size and linear in shape. |
| DNA | Circular | Linear |
| Arrangement | | |
| Mitochondria | Absent | Present. |
| Cytoplasm | Present but cell organelles absent | Present but cell organelles present |
| Endoplasmic Reticulum | Absent | Present |
| Plasmids | Present | Very rarely found. |
| Lysosome | Lysosomes and centrosomes are absent. | Lysosomes and centrosomes are present. |
| Cell Division | Through binary fission | Through mitosis |

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| | PROKARYOTIC CELL | EUKARYOTIC CELL. |
|--------------|----------------------------------|---------------------------------------|
| Flagella. | The flagella are smaller in size | The flagella are larger in size |
| Reproduction | Asexual | Asexual & Sexual. |
| Examples. | Bacteria and Archaea | Plant and for Animal Cell. |

○ Endosymbiosis : A symbiosis wherein the symbiont lives within the body of its host.

→ Symbiosis pertains to a close and long term relationship between organisms of different species. It was initially restricted to mean a relationship between two different species that ~~next~~ interact closely and interdependently.

→ The organism living in a symbiotic relationship is called a

→ Endosymbiosis is a form of symbiosis wherein the symbiont ~~lives~~ lives within the body of its host and the symbiont in endosymbiosis is called endosymbiont.

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PAGE NO.

DATE: / /

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Eg. 1

An example of endosymbiosis is the relationship between Rhizobium and the plant legumes. Rhizobium is the endosymbiont that occurs within the roots of legumes. Rhizobium fix atmospheric nitrogen to convert into a nitrogen form that is ready for use by legume. In return, the legume provides Rhizobium certain metabolites through photosynthesis.

→ In evolution, a theory is conceptualized wherein early symbionts living within the host cell, over time became organelles (i.e., mitochondria and chloroplast) within the eukaryotic cell. This theory is called endosymbiotic theory.

o Membrane Infolding: The invasion of the host prokaryote cell into other prokaryote cells were successful as the host cell membrane infolded to surround both invading prokaryote cells and thereby help transport them into the cell.

→ The membrane did not dissolve but remained intact and thereby created a second membrane around the promitochondria and protochloroplast. It is also known that in modern day eukaryotes the inner membrane of mitochondria and chloroplast contain structure similar to prokaryotes whereas outer membrane has eukaryotic characteristics.

