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Q1: Fill in the Blanks.

I. **Microorganism** *are living things which individually are too small to be seen with naked eye.*
II. *The scientific study of algae is called* **Phycology.**
III. *Diseases causing living organisms are known as* **Phathogenesis.**
IV. **Ribosome** *cell organelle is present both in prokaryotic and eukaryotic cell.*
V. *The power house of cell is known as* **Mitochondria.**
VI. **Binary fission** *is the most common method of asexual reproduction in microbes.*
VII. *Log period of bacterial growth is also known as* **Logarithmic**
VIII. ***Log*** *phase of microbial growth is metabolically active and is for industrial purposes.*
IX. *Shrinkage of cell's plasma membrane caused by osmotic loss of water is called* **Plasmolysis***.*
X. *For synthesis of cellular material nitrogen and sulfur is needed for* ***Protein*** *synthesis.*

Q2: Write short notes on the following.

1) Mitochondria;

Introduction:

- *Mitochandria is the cellular organel which is called power house of the cell.*

Size: *0.5 – 1 micron.*

Location:

- *Mitochandria is present in the muscle cell.*
- *Middle part of the sperm.*

Structure:

Mitrocandria are double membrane bound structure which consist of the following parts.

- *Outer membrane.*
- *Inner membrane.*
- *Intramembranous space.*
- *Cristea.*
- *Mitochondrial matrix.*

Function:

- *Main function of mitochandira is the energy production in the form of ATP.*
- *Mitochandria also play a role in calcium storage and cell death.*

2) Nucleus;

Introduction:

- *Nucleus is the central processing unit of the cell and act as the controlling center of the cell.*

Location:

- *Present centerally in the cell.*

Important component of the nucleus.

- *Nuclear envelope & pore.*
- *Nuclear matrix.*
- *Nuclear chromatin.*
- *Nucleoli.*

Function:

- *Act is a physical barrier between cytoplasm & nucleus.*
- *Help in the chromatin remadding.*
- *Help in the gene expression.*

3) Budding;

Introduction:

- *Budding is an asexual mode of producing new organisim.*
- *In this process the new organisim produce from small part of the body of parents.*
- *In plant and fungi budding is very common .it sometimes it can be formed in animals .*

Example :

- *Hydras or Sponges*

4) Culture media;

Intoduction:

- *Culture media is a special medium used in microbiological laboratries to grow different kinds of micro-organisim.*

❖*It is important to grow microorganisim outside the body of following puroses.*

- *To find the cause of infection from the clinical sample.*
- *To prepare biological products the vaccines antigrns etc.*

5) Growth factors;

Introduction:

- *Essential organic compounds an organisim is unable to synthesize they must be taken from the environment .*
- *Some bacteria have low enzymes need for synthesis for certain vitamins so they must obtain them directly.*

Example:

- *Amino acid.*
- *Purines.*
- *Pyrimidines.*

Q3: What is bacterial growth? Discus different phases of bacterial growth ?

Bacterial growth:

- *Bacterial growth is the incraese in numbers of bacteria but not increase in size of cell.*

Binary fission:

- *Binary fission is most common method of reproduction, asexual reproduction splitting of parent cell into two daughter cells.*

Phases of Growth

1) ***Lag Phase:***
   - *In lag phase the period of little or no cell division .bacteria adapt themselves tp growth conditions its is the time where the different bacteria are maturing and and not yet able to divide. In lag phase of the bacterial growth cycle the synthesis of RNA enzyme and other molecules occurs .Length of this phase depend on type of bacteria sepsis, culyure medium and environmental factors.*

2) ***Log Phase:***

- *In log phase period of growth also know as logarithmic increase and sometime called as exponential growth phase . in this phase rate of growth is constant .*
- *composition of biomasss remains constant*

3) ***Satationary phase:***

- *The satationay phase is often dua to a growth limiting factor such as the deplition of an essential nutrients and /or the formation of an inhabitory product such as an organic acid. Satationary phase results from a situation in which growth rate and death rate are equal.*

4) ***Death phase:***

- *At the death phase (decline phase)bacteria die This could be caused by lack c nutrients,enviromental tmprature above or below the tolerance band for the species,or other injurious conditions.*