

- Note:** i. All questions are compulsory.
ii. Figures to the right indicate full marks.
iii. Draw structures and diagram wherever necessary.

Q.1 A) State True or False:

(04)

- Fossil records are one of the evidences of evolution.
- Bottleneck effect and Founders effect are two examples of gene flow.
- RNA world hypothesis states that self-replicating RNA molecules proliferated before the evolution of DNA and proteins.
- The Heterotroph Hypothesis is the proposal that the first living organism was an autotroph.

Q.1 B) Answer the following: (any three)

(09)

- Write in short about Abiogenesis.
- Write a note on Hardy- Weinberg principle.
- Explain Heterotroph hypothesis.
- Write in brief about RNA world.
- Justify- Gene mutations lead to evolution of organism.
- Write a note on Protein world.

Q.1 C) Answer the following: (any two)

(12)

- Explain Miller's experiment in detail with the help of a diagram.
- Explain Darwinian Theory in brief.
- Describe in detail Big Bang Theory.
- Elaborate on Chemical and Anatomical similarities of related life forms.

Q.2 A) State True or False:

(04)

- All cells have a nucleus.
- There is a cell membrane around all cells.
- A nucleus is smaller than a molecule.
- Chromosomes are found in cytoplasm.

Q.2 B) Answer the following: (any three)

(09)

- How did cell come into existence?
- What happens if cell does not contain mitochondria?
- Give the function of nucleus.
- Write a note on cell wall.
- Enlist the characteristics of prokaryotic genome.
- Explain metaphase with neat and labelled diagram.

Q.2 C) Answer the following: (any two)**(12)**

- Write the difference between prokaryotic cell and eukaryotic cell.
- Explain in detail the function of cytoskeleton.
- Explain the characteristics of fluid mosaic model with neat and labelled diagram.
- Write structure and function of chloroplast.

Q.3 A) State True or False:**(04)**

- All micro-organisms have flagella.
- Agar acts as a carbon source in nutrient medium.
- The cell wall of gram negative bacteria have high lipo-polysaccharide layer.
- Cilia helps in locomotion in all bacteria.

Q.3 B) Answer the following: (any three)**(09)**

- Explain in brief the principle and significance of staining.
- Write a brief note on Contribution of Leeuwenhoek in microbiology.
- Explain the different shapes of bacterial arrangement.
- Explain the concepts of Extremophiles.
- Explain the different arrangement of flagella in bacteria.
- Explain the principle of Gram Staining.

Q.3 C) Answer the following: (any two)**(12)**

- Elaborate on the method and principle of Capsule staining State the functions of capsule.
- Write an Elaborative note on structure of bacteria along with suitable diagram.
- Justify- The contribution of Pasteur to the field of microbiology.
- Explain the principle of staining and the different types of stains used in identification of bacteria.

Q.4 A) Define and explain: (any five)**(10)**

- (i) Panspermia hypothesis (ii) GADV- Proteins (iii) Nuclear Pore (iv) Chromosomes
(v) Staining reaction (vi) Thermophiles (vii) Nuclear membrane

Q.4 B) Answer the following: (any three)**(15)**

- Justify- Fossils are major evidences of evolution.
 - Explain the Mechanisms of Evolution.
 - Explain in detail mitosis cell division.
 - Write about reductional division in detail.
 - Describe in detail Acid fast staining.
 - Write a note on bacteria surviving in extreme conditions.
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