

(3 Hours)

(100 Marks)

**Instructions to the candidates:**

**Please check that you have received the correct question paper.**

- i) All questions are compulsory. Choice is internal
- ii) Figures to the right indicate full marks.
- iii) Draw structures/flowcharts/diagrams wherever necessary.

**Q.1 (A) State True or False:**

(04)

- (i) Theory of Panspermia states that life originated on earth from asteroids.
- (ii) Darwin gave the endosymbiotic theory.
- (iii) Analogous organs are the ones with different functions but similar structure.
- (iv) RNA world hypothesis states that RNA was the first genetic material.

**Q.1 (B) Attempt the following: (Any three)**

(09)

- (i) Compare and contrast: Gene flow and genetic drift.
- (ii) Define and explain: Hardy-Weinberg principle.
- (iii) Write a note on contributions of Louis Pasteur on the understanding of origin of life.
- (iv) Briefly explain: 'RNA world'.
- (v) What does it mean by retrograde evolution?
- (vi) Explain in brief: Protenuoids.

**Q.1 (C) Attempt the following: (Any two)**

(12)

- (i) Write a detailed note on criticism of Darwin's theory of natural selection.
- (ii) Give an account of different types of fossils.
- (iii) Discuss in detail the theory of spontaneous generation and chemical evolution.
- (iv) Explain in detail the Urey-Miller experiment.

**Q.2 (A) State True or False:**

(04)

- (i) Endoplasmic reticulum is called traffic police of the cell.
- (ii) Chlorophyll is present in the stroma of chloroplast.
- (iii) Mitosis is called reductional division.
- (iv) Microtubules and microfilaments are synonyms.

**Q.2 (B) Attempt the following: (Any three)**

(09)

- (i) Explain in brief the structure of cell wall.
- (ii) Justify: Yeast is a link between prokaryotes and eukaryotes.
- (iii) Discuss the different stages of Mitosis.
- (iv) Name the organelle which is referred to as digestive machinery of cell. Write a short note on the same.
- (v) Differentiate between prokaryotic and eukaryotic ribosomes.
- (vi) Write the functions associated with Golgi bodies.

**Q.2 (C) Attempt the following: (Any two)**

(12)

- (i) Write a detailed note on structure and functions of mitochondria.
- (ii) Which human cells undergo meiosis? Explain the different phases of meiosis in detail.
- (iii) Give a detailed account of plastids.
- (iv) Discuss the Singer-Nicholson model of plasma membrane.

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

(04)

- (i) Chain of rod shaped bacteria is called as streptobacilli.
- (ii) Gram negative bacteria have thick peptidoglycan layer.
- (iii) Robert Hooke is known as Father of medical microbiology.
- (iv) Bacteria that grow in high salt concentration are known as magnetotactic.

**Q.3 (B) Attempt the following: (Any three)**

(09)

- (i) Compare and contrast: Spore and Cyst.
- (ii) Discuss the classification of bacteria based on flagellar arrangement.
- (iii) Justify: 'Bacteria have varied temperature requirements'
- (iv) Explain the importance of taxonomy of microorganisms.
- (v) Describe the bacterial cell wall composition.
- (vi) Mention the primary and secondary stain in lipid staining. State the role of each.

**Q.3 (C) Attempt the following: (Any two)**

(12)

- (i) Explain the principle of Gram staining. Also, give the role of each stain.
- (ii) Describe the morphology of the structures present external to the bacterial cell wall.
- (iii) Elaborate on the contributions of Leeuwenhoek, and Pasteur to the field of microbiology.
- (iv) Classify bacteria based on their morphology and shape.

**Q.4 (a) Define and explain: (Any five)**

(10)

- (i) Chemotaxis    (ii) Spheroplast    (iii) Protoplast    (iv) Prokaryotes
- (v) Microfilaments    (vi) Cisternae    (vii) Natural selection

**Q.4 (b) Write elaborate notes on: (Any three)**

(15)

- (i) Negative Staining
- (ii) Classification based on nutritional requirement
- (iii) Dr. Francesco Redi's experiment
- (iv) Endosymbiotic theory
- (v) Peroxisome
- (vi) Ultrastructure of Nucleus

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