

3 hours

(100 Marks)

Instructions:

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

Q.1 A) State True or False:

(04)

- (i) Initial genetic material on the earth was in the form of clay genes.
- (ii) Theory of panspermia is also called as Abiogenesis.
- (iii) Duck billed platypus is a connecting link between reptiles and mammals.
- (iv) Natural selection depends on geographical location.

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

(09)

- (i) Write in short about Big Bang theory.
- (ii) Justify- Gene mutations lead to the evolution of organism.
- (iii) Write a note on Francesco Redi's experiment.
- (iv) Write in brief on demerits of Darwinism.
- (v) Discuss about types of fossils giving suitable examples.
- (vi) Write a note on Hardy-Weinberg principle.

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

(12)

- (i) Describe in detail Endosymbiont theory.
- (ii) Write in detail about chemical and anatomical similarities of different life forms.
- (iii) Justify: Miller's experiment supports chemical evolution hypothesis.
- (iv) Elaborate on modern synthetic theory of evolution and its factors.

Q.2 A) State True Or False:

(04)

- (i) Bacteria are only existing prokaryotes.
- (ii) *Chlorella* and *Spirogyra* are used as model organisms in genetic engineering.
- (iii) Spindle microtubules are attached to centriole.
- (iv) The main function of nucleolus is production of ribosomes.

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

(09)

- (i) With the help of a neat labelled diagram explain the prokaryotic cell.
- (ii) Distinguish between microtubules and microfilaments.
- (iii) Write a note on: structure of plant cell wall.
- (iv) With the help of a diagram, discuss the structure of mitochondria.
- (v) Discuss the functions of Golgi complex.
- (vi) State functions of lysosomes mentioning any two enzymes present in it.

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

(12)

- (i) Describe in detail, the process of reduction cell division.
- (ii) Elaborate on the types, structure and functions of endoplasmic reticulum in the cell.
- (iii) Give detailed account of structure and functions of chloroplast. Support your answer with a neat labelled diagram.
- (iv) Justify: "Nucleus is the most important cell organelle which controls all the cellular processes."

Q.3A) State True or False:

(04)

- (i) All microorganisms have flagella.
- (ii) Cilia help in locomotion of all bacteria.
- (iii) The cell wall of Gram positive bacteria has thin peptidoglycan layer.
- (iv) Halophiles can survive in high salt concentration.

Q.3 B) Answer the following: (Any three)

(09)

- (i) Explain in detail, the different placements of flagella in bacteria.
- (ii) Discuss the classification of bacteria based on their shape.
- (iii) Write in brief on nutrition in bacteria.
- (iv) Explain the different techniques employed for grouping bacteria into specific genera.
- (v) Write in brief principle and significance of staining.
- (vi) What is spore? Discuss the composition and the conditions of its formation.

Q.3 C) Answer the following: (Any two)

(12)

- (i) Describe in detail, citing suitable examples, various categories of the bacteria surviving in extreme environment. State the significance of the same.
- (ii) Justify: Invention of Leeuwenhoek made remarkable contribution to the field of microbiology.
- (iii) Write an elaborative note on Gram staining stating the role of each constituent used for it.
- (iv) Elaborate on the principle and method of Capsule staining. State the functions of capsule.

Q.4 A) Define and explain (any five)

(10)

- | | | | |
|-------------|------------------|-------------------|-----------------|
| (i) Taxa | (ii) Fossil | (iii) Coacervates | (iv) Centromere |
| (v) Plastid | (vi) Kinetochore | (vii) Flagellin | |

Q.4 B) Answer the following (any three)

(15)

- (i) Explain in detail the contribution of Pasteur in theories of origin of life.
- (ii) Justify: Man has evolved from primates.
- (iii) Elaborate on the ultrastructure of ribosomes and its biogenesis.
- (iv) Write an informative note on peroxisomes.
- (v) Describe the acid fast staining technique.
- (vi) With the help of a diagram, explain the structure of a bacterial cell.