

Subject: **Botany**
Paper name: **Microbiology, Cytology, Genetics, Evolution**
Paper No: **BOT/IV/EC/07**
Semester: **4th Semester**

A. Multiple choice questions [25 (5 from each unit)]

1. Microorganisms includes
 - a) Bacteria
 - b) Fungi
 - c) Algae
 - d) All of the above

2. Shapes of bacterial cells are
 - a) Coccus
 - b) Bacillus
 - c) Spirillum
 - d) All of the above

3. Folded invaginations of plasma membrane in bacteria is called
 - a) Mesosomes
 - b) Mitochondria
 - c) Chromatophore
 - d) Microcapsule

4. Genetic recombination in bacteria occurs through
 - a) Transformation
 - b) Conjugation
 - c) Transduction
 - d) All of the above

5. T2 phage of bacterial virus consists of
 - a) DNA head
 - b) Sheath
 - c) Tail fibre
 - d) All of the above

6. In Carbon cycle, atmospheric carbon dioxide (CO₂) is formed by
 - a) Microbial decomposition
 - b) Photosynthesis

- c) Non photosynthetic organism
 - d) All of the above
7. In nitrogen cycle, symbiotic N₂ fixing microorganism is called
- a) *Rhizobium*
 - b) *Closteridium*
 - c) *Azotobacter*
 - d) *Achromobacter*
8. In preparation of fermented food (Soya sauce) predominant microorganism is
- a) *Aspergillus oryzae*
 - b) *Lactobacillus plantarum*
 - c) *Mucor* sp.
 - d) None of the above
9. Which of the following microorganism is used in preparation of alcoholic beverages
- a) *Saccharomyces cereviseae*
 - b) *Escherischia coli*
 - c) *Pseudomonas floescens*
 - d) All of the above
10. Proteases enzyme used in tanning of leather and additive for detergent is obtained from
- a) *Aspergillus niger*
 - b) *Bacillus subtilis*
 - c) *Streptomyces*
 - d) *Pseudomonas*
11. DNA Replication takes place during _____ of cell cycle.
- a) G₁ Phase
 - b) S Phase
 - c) G₂ Phase
 - d) G₀ phase
12. Microfilaments are composed of a protein called
- a) Tubulin
 - b) Actin
 - c) Myosin
 - d) Chitin

13. Cell was first discovered by
- Robert Brown
 - Robert Hooke
 - Schwann
 - Tatum
14. Law of segregation represents
- Purity of gametes
 - Alleles separate during gametogenesis
 - Segregation of factor due to the segregation of chromosome during meiosis
 - all of the above
15. _____ provide the site for lipid biosynthesis, metabolism of certain drugs and toxic compounds
- Golgi bodies
 - Mitochondria
 - Amyloplasts
 - Smooth endoplasmic reticulum
16. The **Chromosomal Theory of inheritance** was proposed by
- Sutton and Boveri
 - Creighton and McClintock
 - Messelson and Stahl
 - Mendel
17. DNA is wrapped around histone molecules to form _____
- Nucleoside
 - Nucleosome
 - Cyclin
 - Nucleotide
18. Homologous recombination, including chromosomal crossover occurs during
- Leptotene
 - Zygotene
 - Pachytene
 - Diplotene
19. Linked genes are
- Located on same chromosome
 - Located on different chromosome

- c) Rarely inherited together
- d) None of the above

20. Following cell is in

- a) Early prophase
- b) Metaphase
- c) Late prophase
- d) Telophase



21. “The efficiency and development of an organ is directly proportional to its use and disuses.” The statement is a subset of evolution theory found under

- a) Darwinism
- b) Mutation theory
- c) Lamarckism
- d) All of the above

22. The theory of pangenesis was proposed by

- a) Jean-Baptiste Lamarck
- b) Hugo de Vries
- c) G.L. Stebbins
- d) Charles Robert Darwin

23. Hugo de Vries conducted his mutation experiments on

- a) *Homo sapiens*
- b) *Oenothera lamarckiana*
- c) *Pisum sativum*
- d) None of the above

24. The essay that corroborate the theory of natural selection titled “On the Tendency of Varieties to Depart Indefinitely from the Original Type (1858)” was written by

- a) Charles Darwin
- b) Alfred Russel Wallace
- c) Jean Baptiste Lamarck
- d) Hugo de Vries

25. Mutations are generally recessive while traits taking part in evolution are usually

- a) dominant
- b) retrogressive
- c) homozygous
- d) negative

B. Fill up the blanks [15 (3 from each unit)]

1. Viral parasites of bacteria are called _____
2. Circular double stranded DNA molecule found in bacterial cells are called _____
3. In bacteria, conjugation tube is formed by special appendages called _____
4. Certain microorganisms are capable of reducing nitrate(NO_3) to nitrite(NO_2), subsequently to gaseous nitrogen(N_2) and the process is called _____
5. Antibiotic penicillin is obtained from the mould called _____
6. Common microorganism present in contaminated water is _____
7. Heterochromatin DNA genes are _____
8. In heterozygous conditions dominant alleles does not completely mask the phenotype expression of recessive alleles but results in an intermediate phenotypes called _____
9. In _____ phase of mitosis appearance of cleavage furrow starts to separate the daughter cells.
10. The exchange of chromosome segments is called _____
11. _____ is the site of cellular respiration
12. _____ and mitochondria have extranuclear DNA.
13. Lamarck's views on the evolutionary mechanisms are expressed in his writing _____
14. _____ refers to the slow and gradual process by which living organisms have changed from the simplest unicellular form to the most complex multi-cellular forms that exist today.
15. Hugo de Vries in 1901 wrote his book entitled "Species and Varieties, Their Origin by _____"

Key Answers

A. Multiple choice questions

- | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|
| 1. d) | 2. d) | 3. a) | 4. d) | 5. d) | 6. a) | 7. a) |
| 8. a) | 9. a) | 10. b) | 11. b) | 12. a) | 13. b) | 14. d) |
| 15. d) | 16. a) | 17. b) | 18. c) | 19. a) | 20. a) | 21. c) |
| 22. d) | 23. b) | 24. b) | 25. a) | | | |

B. Fill up the blanks

1. Bacteriophages
2. Plasmid
3. Sex pilli
4. Denitrification
5. *Penicillium notatum*
6. *Escherischia coli*
7. Inactive
8. Incomplete dominance
9. Cytokinesis
10. Crossing over
11. Mitochondria
12. Chloroplast
13. *Philosophie Zoologique*
14. Organic evolution
15. Mutation