

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Fourth Semester

Microbiology — Core

MICROBIAL GENETICS

(For those who joined in July 2020 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The beginning of understanding genetic transformation in bacteria was made by
(a) Watson and Crick
(b) Hershey and Chase
(c) Frederick Griffith
(d) T.H. Morgan

5. Positive strand RNA viruses have which of the following characteristics?
(a) their genome RNA can be translated directly as mRNA
(b) their genome is circular
(c) their RNA genome is segmented
(d) they have to transcribe their genome RNA to a mirror image copy as a mRNA
6. The delayed early genes codes for which of the following enzymes?
(a) Phage enzymes (b) Nucleases
(c) RNA polymerase (d) Oxidases
7. Addition or deletion of bases causes which kind of mutation
(a) Transversion
(b) Frame shift mutation
(c) Transition
(d) Transcription
8. In mutation even, when adenine is replaced by guanine, it is a case of
(a) transition (b) transcription
(c) transversion (d) frame shift mutation

2. Hershey and - Chase experiment confirms that
(a) DNA is always formed from DNA in semi conservative manner
(b) Sulphur and protein both enter in bacterial cell progeny
(c) DNA is genetic material, not protein
(d) radioactive phosphorus was only found in surrounding
3. Find the in correct statement about plasmids
(a) they are circular
(b) they replicate independently
(c) they are transferable
(d) they are single stranded
4. The IS elements can be identified by the presence of
(a) Antibiotic resistance gene
(b) Endonuclease cleavage site
(c) 50bp inverted repeat
(d) Integrase site

9. Introduction of DNA molecules in to the recipient organism is termed as _____
(a) Transformation (b) Translation
(c) Transduction (d) Transcription
10. Electroporation is also used for taking up the DNA by the cells. It constitutes of
(a) Inserting the DNA in to the cells via an electric shock
(b) Increased efficiency than both natural and chemical methods
(c) Causing the least amount of damage in comparison to other methods
(d) Decreased efficiency than both natural and chemical methods

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Write a short notes about chemical composition of RNA.
Or
(b) Explain RNA as genetic material.
12. (a) Write about the metal resistance of plasmids.
Or
(b) Give an account on colicinogenetic plasmids.

13. (a) Explain the replication of positive strand RNA viruses.

Or

(b) Briefly write the structure and organization of viral genome.

14. (a) Describe about mutagen. Add note on chemical mutagen.

Or

(b) Explain the detection of mutants by Ames test.

15. (a) Give a concise account on bacterial conjugation.

Or

(b) Write briefly about transduction.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Explain the physical and chemical composition of DNA.

Or

(b) Describe DNA as a genetic material - experimental evidences.

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17. (a) Explain in detail structure and properties of bacterial plasmids.

Or

(b) Describe the mechanism of plasmid DNA replication in prokaryotes.

18. (a) Explain the general characteristics of polio virus and steps involved in replication.

Or

(b) Write in detail the steps involved in replication of pox virus.

19. (a) Write an essay on mechanism of DNA repair.

Or

(b) What is mutation? Briefly explain the different types of mutation.

20. (a) Explain the genetic exchange in bacteria by transduction.

Or

(b) Describe in detail the process of transformation in bacteria.

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