

Reg. No. :

Code No.: 20543 E

Sub. Code: CMMI 41

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Microbiology - Core

MOLECULAR BIOLOGY AND MICROBIAL
GENETICS

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Identify the founder of molecular biology.
(a) Linus Carl Pauling (b) James Watson
(c) Francis H. Crick (d) Mahlon B. Hoaland
2. _____ RNA polymerases are present in a bacterial system.
(a) 1 (b) 2
(c) 3 (d) 4
3. Predict the following enzymes are used in the process of transcription.
(a) DNA polymerase (b) RNA polymerase
(c) DNA helicase (d) DNA topomerase

4. The repressor protein is encoded by _____
 (a) regulatory gene (b) structural gene
 (c) T-DNA (d) rRNA
5. Choose the mode of DNA replication in E.coli
 (a) conservative and unidirectional
 (b) semi conservative and unidirectional
 (c) conservative and bi-directional
 (d) semi conservative and bi-directional
6. The process by which protein synthesis from genetic code occurs by _____
 (a) transcription (b) replication
 (c) translation (d) reproduction
7. _____ number of restriction sites are contained by a plasmid.
 (a) less than 1 (b) 1
 (c) 2 (d) more than 1
8. Select the genome of virus.
 (a) DNA (b) RNA
 (c) DNA or RNA (d) DNA and RNA
9. Choose the process is also known as the removal of one or more bases from the nucleotide chain.
 (a) insertion (b) transition
 (c) deletion (d) transversion
10. The transfer of naked DNA from one cell to another is referred to as _____
 (a) transduction (b) conjugation
 (c) transformation (d) lytic cycle

PART B — (5 × 5 = 25 marks)

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

11. (a) Predict the major parts and their importance of chromosome.
 Or
 (b) DNA as a genetic materials of living organisms – Explain.
12. (a) Interpret the few post transcriptional mechanisms.
 Or
 (b) Describe the mechanism of gene regulation in trp operon.
13. (a) Choose the enzymatic activities of DNA polymerase I.
 Or
 (b) Write short notes on the components of translation process.
14. (a) Select the aim of plasmid amplification.
 Or
 (b) Explain the step involved in the lytic cycle of T7 bacteriophage.
15. (a) Summarize the SOS repair mechanism.
 Or
 (b) Assess the method of gene transfer by electroporation.

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 characteristic features of plasmid, types and its function.

Or

- (b) Discuss the enzymology of DNA replication and add notes on rolling circle replication.

17. (a) Summarize the mechanism of prokaryotic transcription.

Or

- (b) Illustrate the process of translation in eukaryotes.

18. (a) Write the difference between eukaryotic and prokaryotic DNA replication.

Or

- (b) Examine the post transcriptional modification in eukaryotes and its significance.

19. (a) Illustrate the structure and types of bacterial transposons.

Or

- (b) Explain the organization of Retroviral genome.

20. (a) Distinguish between spontaneous and induced mutation.

Or

- (b) Appraise the process of conjugation in bacteria.