NEW

Part–III 3-Tier

2019

MICROBIOLOGY

(Honours)

PAPER—VI

Full Marks : 90

Time : 4 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group—A

1. Answer any *two* questions. 2×15

(a) What are dominant and recessive characters ? What is allele ? 2+1

(b) Differentiate between cistron ad recon. 2

(c) Describe the solenoid model of nucleosome structure. 4

(d) What are the different types of plasmid found in bacteria? State their utility. 2+2

(e) State four salient features of Mitochondrial DNA. 2

2. (a) What is reverse transcription ? 2

(b) DNA replication is semiconservative—explain. 3

(c) State the wobble hypothesis. 2

(d) How attenuation controls tryptophan operon ? 4

(e) Pictorically explain the Hfr×F^- conjugation. 4

3. (a) Explain transition and transversion. How frameshift mutation is differs from them. 2+1

(b) Explain the Ames test. 4

(c) How auxotrophic mutant can be isolated ? 3

(d) Describe the SOS repair system. 3

(e) Write the uses of the following : 2

(i) Polynucleotide kinase

(ii) terminal transferase

4. (a) Why restriction endonuclease type-II is favoured in cloning experiment ? 2

(b) Draw and describe the YAC vector. 4

(c) Describe the Sanger method of DNA sequencing. 5

(d) Write the applications of genetic engineering in agriculture. 4

Group—B

Answer any *five* questions : 8×5

5. (a) Diagrammatically explain the colony hybridization technique. 4

   (b) State the applications of PCR. 4

6. (a) Differentiate electroporation and microinjection techniques. 4

   (b) Briefly state the ethical issues associated with genetic engineering. 4

7. (a) State the process of blue-white selection of PUC 19 vector. 4

   (b) Differentiate genomic library and c-DNA library. 4

8. (a) Explain the restriction modification system. 4

   (b) What is shuttle vector? Cite example. 2

   (c) What is photoreactivation ? 2

9. (a) 'Mendel's law of inheritance is not followed in case of co-dominance'—explain with example. 3

   (b) Explain epistasis with suitable example. 4

   (c) What is mutational hot-spot ? 1

10. (a) What is polytene chromosome ? 2

    (b) Distinguish between nucleoid and nucleosome. 4

    (c) What is Is element ? 2

11. (a) State the process of replication in prokaryotes. 5

(b) How transcription can be terminated ? 3

12. (a) 'C-AMP have important role in β-galactosidase biosynthesis'—explain. 2

(b) State the molecular mechanism of lytic-lysogenic conversion. 4

(c) Define operon.

Group—C

Answer any *five* questions : 5×4

13. Briefly explain the Luria-Delbruck's fluctuation test . What is conditional mutation ? 3+1

14. Compare generalized and specialized transduction. 4

15. State the significance of recombination ? What is LINEs and SINEs ? 2+2

16. State the role of telomere and centromere. What is genetic code ? 2+2

17. What is base analog ? Cite example. What is meant by 'Charging of t-RNA' ? 2+2

18. Describe the Northern blotting process in flow chart. 4

19. What is DNA microarray ? Differentiate RFLP and RAPD 2+2

20. Write the importance of genetic engineering in environmental pollution control. 4

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