

2020

MICROBIOLOGY — GENERAL

Paper : DSE-A-1

(Genetic Engineering And Biotechnology)

Full Marks : 50

The figures in the margin indicate full marks.

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

Day 1

Group - A

1. Answer **any five** questions : 2×5
- (a) Write down two features of Ti plasmid.
 - (b) Give two properties of a bacterial host.
 - (c) What chemical is used in chemical transformation of *E.Coli*? Who developed Southern Blotting technique?
 - (d) What are used as probes in Southern and Western Blotting?
 - (e) Give two examples of type II restriction enzyme.
 - (f) What are the enzymes used in RTPCR?
 - (g) What is the full form of SDS-PAGE?
2. Write short notes on (**any three**) : 5×3
- (a) Genomic DNA library
 - (b) Sanger dideoxy sequencing
 - (c) Dot Blot Technique
 - (d) Bt Brinjal
 - (e) Western blotting technique.

Group - B

Answer **any five** from the following.

3. (a) Write down a difference between Type I and Type II restriction enzymes.
- (b) How does bacteria protect its own DNA from restriction enzymes?
- (c) Give one example each of blunt end cutter and sticky end cutter restriction enzymes. 2+1+2

Please Turn Over

4. Write notes on : 2½×2
- (a) Patent
 - (b) Cloning vector
5. Write down two characteristics features each of BAC and YAC vectors. What is YEP? 2+2+1
6. Write a note on Electroporation technique. 5
7. Why do we need directional cloning and how it is performed? 2+3
8. (a) How do you label a probe used in Southern blotting?
(b) What is capillary blotting used in Southern hybridization? Describe with a suitable diagram. 2+3
9. Schematically describe the steps of a typical Polymerase Chain Reaction (PCR). 5
10. (a) What are the properties of a good vector?
(b) What are cloning and expression vectors? 3+2
-

2020

MICROBIOLOGY — GENERAL

Paper : DSE-A-2

(Microbes in Environment)

Full Marks : 50

The figures in the margin indicate full marks.

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

Day 1

Question no. 1 is compulsory and answer **any four** questions from the rest.

1. Answer **any five** questions : 2×5
- (a) What is biogeochemical cycling?
 - (b) What is microbial niche and microbial habitat?
 - (c) Write down two important differences between BOD and COD.
 - (d) What is meant by bioaerosol?
 - (e) Name two microorganisms found in the genito-urinary tract of a healthy human being.
 - (f) What are the biotic components of an ecosystem?
 - (g) What are halophiles? Give an example.
 - (h) Give two examples of phosphate solubilizing bacteria.
 - (i) Give any two examples of microbe-animal interaction.
 - (j) Define nematophagous fungi with a relevant example.
2. (a) Give a schematic profile of soil.
(b) Define symbiosis. Write in brief what you know about symbiotic relations of microorganisms in soil. 3+(2+5)
3. (a) What is symbiotic nitrogen fixation? Briefly describe the mechanism.
(b) What is leg haemoglobin? What is its function?
(c) What is nitrification? (2+3)+(1+2)+2
4. (a) Mention the sources of solid waste and their types.
(b) Briefly describe the methods of secondary treatment of waste water.
(c) Name two pesticide degrading bacteria. 3+5+2

Please Turn Over

5. (a) Write short notes on :
- (i) Trickling filter process of municipal waste water.
 - (ii) Membrane filter technique for the bacteriological examination of water.
- (b) Define the following terms :
- (i) Oligotrophs
 - (ii) Obligate halophiles
 - (iii) Flora of open sea. (2½×2)+(2+2+1)
6. (a) What are fecal coliforms? Which types of microorganisms are used as indicators of fecal contamination of water other than coliforms?
- (b) What are activated sludge? Compare the microbial activity in the activated sludge process with that which occurs in a septic tank. (2+3)+(2+3)
7. (a) What do you mean by bioremediation?
- (b) Why do petroleum degrading bacteria need to attach to the surface of oil droplets?
- (c) What do you mean by reductive dechlorination?
- (d) What is Winogradsky column?
- (e) Why sulphate is added into a Winogradsky column? 2+2+2+2+2
-