2021

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.

Group - A

1. Answer ***any five*** questions : 2×5

(a) Write down *any two* features of pBR cloning vector.

(b) Write down the differences between Type-I and Type-II restriction enzymes.

(c) What are the differences between kinases and phosphatases?

(d) Give two examples of vectors which can transfer eukaryotic gene.

(e) Write down two importances of taking copyright.

(f) What are the two properties of a good vector?

2. Write short notes on (***any three***) : 5×3

(a) SDS-PAGE

(b) Role of RDT in insulin production

(c) Bt-transgenic cotton

(d) Polymerase chain reaction

(e) Cosmid vectors.

Group - B

Answer ***any five*** from the following.

3. (a) What do you mean by Real-time PCR?

(b) What is the purpose of Northern blotting? 2½+2½

4. (a) Briefly describe any approach for identification and isolation of recombinant clone carrying the desired DNA insert.

(b) Name one type-II restriction endonuclease. 4+1

5. Write notes on : 2½×2

(a) Transformation of DNA as genetic material

(b) Significance of Patents.

6. (a) What is YC_p?

(b) Write down two characteristic features of *E. coli lac* promoter and T7 promoter–based vectors. 1+(2+2)

7. Schematically describe the steps of cDNA library construction. 5

8. (a) Why do you think that DNA-sequencing of a gene is important?

(b) Write down Sanger's method of DNA sequencing. Describe with a suitable diagram. 1+(2½+1½)

9. (a) Write down two applications of genetic engineering in the field of human therapeutic interest.

(b) How much gene length can we transfer by using the bacteriophage lambda as cloning vector?

(c) What do you understand by shuttle vector? 2+1+2

10. Explain the role of the following in gene cloning :

(a) terminal deoxynucleotidyl transferase

(b) reverse transcriptase. 2½+2½