

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

Please Turn Over

5. Write notes on : 2½×2
- (a) Transformation of DNA as genetic material
 - (b) Significance of Patents.
6. (a) What is YC_p? 1+(2+2)
- (b) Write down two characteristic features of *E. coli lac* promoter and T7 promoter-based vectors.
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
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