

**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 3**

**Group - A**

1. Answer **any five** questions : 2×5
- (a) What are restriction endonucleases?
  - (b) What is cDNA?
  - (c) What are 'linkers' in recombinant DNA technology?
  - (d) What is RAPD?
  - (e) What kind(s) of restriction endonuclease(s) is(are) used in recombinant DNA technology?
  - (f) Write two important uses of genetic engineering for humankind.
  - (g) What is the difference between hexacutter and tetracutter restriction endonucleases?
2. Write short notes on **any three** : 5×3
- (a) RFLP
  - (b) Southern blot
  - (c) Plasmid DNA
  - (d) Recombinant vaccines
  - (e) DNA agarose gel electrophoresis.

**Group - B**

Answer **any five** from the following.

3. (a) What is Taq DNA polymerase?  
(b) Why is it used in PCR?  
(c) What is annealing temperature in PCR? 1½+2+1½

**Please Turn Over**

4. (a) How do you select a *E.coli* transformant harboring a plasmid with amp<sup>R</sup>-gene?  
(b) What is self ligation of a vector? 3+2
5. (a) What is reverse transcriptase? How does it differ from DNA polymerase?  
(b) What is multiple cloning site in a cloning vector? (1½+2)+1½
6. (a) Describe differences between chemical method and electroporation for the bacterial transformation with plasmid DNA.  
(b) Write the name of two viral vectors used in gene therapy. 3+(1+1)
7. You would like to perform whole genome sequencing of an isolated bacteria. Will you perform automated sequencing or Sanger's dideoxy sequencing for this purpose? Explain your answer. 5
8. Write short note on 'microinjection' for gene delivery. 5
9. What is high copy number vector? Write the name of a high copy number vector. Write one advantage and one disadvantage of using high copy number vector in recombinant DNA technology. 1+1+(1½+1½)
10. (a) How do you compare the expression of a gene under two different condition?  
(b) What is the function of alkaline-phosphatase in cloning? 3+2
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