

Total No. of Questions : 8]

SEAT No. :

P2142

[Total No. of Pages : 3

[4930]-402
M.Sc. (Semester - IV)
MICROBIOLOGY
MB - 802 : Molecular Biology - II
(2013 Pattern) (Credit System)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:-

- 1) Attempt any three questions from 1 to 4 (core credit).*
- 2) Attempt any two questions from 5 to 8 (non -core credit).*
- 3) All questions carry equal marks.*
- 4) Draw neat diagrams wherever necessary.*
- 5) Figures to the right indicate full marks.*
- 6) Use of log tables / graph papers / scientific calculator is allowed.*
- 7) Assume suitable data if necessary.*

Q1) Attempt any two of the following: **[10]**

- a) Explain the principle of Maxam and Gilbert method of genome sequencing.
- b) What are SNPs? Give their significance in genomics.
- c) Elaborate on DNA imprinting.

Q2) Attempt any two of the following : **[10]**

- a) What is meant by DNA cloning? What steps are used to clone genomic DNA?
- b) What are expression vectors? Explain the use of an expression vector with suitable example.
- c) Give structural details of YAC. State the importance of YAC in cloning.

Q3) Attempt any two of the following : **[10]**

- a) With the help of a flow sheet explain synthesis of a novel antibiotic using RDT.
- b) How are high quality protein drugs synthesized by constructing recombinant DNA?
- c) What genetic mechanism is involved in the synthesis of xanthan gum?

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- Q4)** Attempt any two of the following : **[10]**
- a) What is the difference between a gene and an ORF? Explain whether all ORFs correspond to a true gene?
 - b) Explain site directed mutagenesis with a suitable example and comment on its importance in genomics.
 - c) Justify: 'RDT can be used in the synthesis of an amino acid.'
- Q5)** Attempt any two of the following : **[10]**
- a) What ethical issues are associated with the use of GM crops?
 - b) What are genetically modified animals? For what purposes they are produced?
 - c) Give structural details of a Ti plasmid. Explain the use of Ti plasmid in the production of transgenic plants.
- Q6)** Attempt any two of the following : **[10]**
- a) What is meant by bioremediation? Explain why *Pseudomonas* is called a superbug.
 - b) Give a flow sheet for the production of fructose and alcohol from starch Explain how alcohol production can be improved using GMO.
 - c) What are xenobiotics? Giving suitable example explain a mechanism of engineered pathway for degradation of a xenobiotic compound.
- Q7)** Attempt any two of the following : **[10]**
- a) Elaborate on various genetic techniques used in sequencing human genome?
 - b) What are the salient features of *E. coli* genome project?
 - c) Give significance of human genome project in disease investigation and treatment.

Q8) Attempt any two of the following :

[10]

- a) Giving suitable examples explain how a GM plant can act as bioreactor for the production of a variety of therapeutic agents.
- b) How will you screen recombinant *E. coli* strains liberating cellulase?
- c) Write a protocol for gene annotation.

