This question paper contains 4 printed pages]

*Your Roll No.* .....

1034

**B.Sc. (Hons.)/II** **C**

MICROBIOLOGY—Paper X

(Microbial Genetics and Molecular Biology)

(Admissions of 2004 and onwards)

*Time* : 3 *Hours* *Maximum Marks* : 60

*(Write your Roll No on the top immediately on receipt of this question paper.)*

Attempt any *five* questions.

*All* questions carry equal marks.

1. What is the function of the following sequences or proteins (any *twelve*) ? 12×1=12

   (*i*) -35 region of promoters

   (*ii*) Shine-Dalgarno sequences

   (*iii*) DNA Helicase

P.T.O.

(*iv*) DNA Ligase

(*v*) CTD of RNA Polymerase II

(*vi*) TATA Box

(*vii*) Release Factor I

(*viii*) IF-I

(*ix*) DNA glycosylase

(*x*) Photolyase

(*xi*) $T_\gamma$ elements

(*xii*) TF IIH

(*xiii*) β clamp

(*xiv*) CI repressor.

2. Write short notes on the following (any *three*) : 3×4=12

(*i*) Generalized transduction

(*ii*) Mismatch Repair

(*iii*) Lac Operon

(*iv*) rho dependent transcription termination

(*v*) Replicative transposition

3. (*a*) What are the ways of transformation of *E.coli* cells with foreign DNA ? 4

(*b*) Explain the mechanism of replication of mitochondrial genome. 3

(*c*) Explain the significance of Ames test and the various components used in performing this test. 3

(*d*) What is function of DNA polymerase I ? 2

4. Write brief notes on the following (any *four*) : 4×3=12

(*i*) Plasmid amplification

(*ii*) Codon bias

(*iii*) Catabolite repression

(*iv*) Mutator genes

(*v*) Tn 10.

5. (*a*) Explain the Rolling Circle Model of replication. 3

(*b*) What is the post-translational modification of proteins ? 3

(*c*) Write the mechanism of 5` capping of eukaryotic *m*-RNA and its significance for the cell. 4

(*d*) Explain conditional mutations with the help of an example. 2

6. (*a*) Give an example of a plasmid found in yeast and write its salient features. 3

(*b*) Explain the mechanism of attenuation of trp operon with the help of suitable illustrations. 6

(*c*) List all possible reasons for the occurrence of spontaneous mutations in a genome. 3