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5864

Your Roll No

B.Sc. (Hons.) / II

J

MICROBIOLOGY – Paper X

(Microbial Genetics and Molecular Biology)

(NC – Admissions of 2004 & onwards)

Time 3 Hours

Maximum Marks 60

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

*Attempt Five questions in all  
Q 1 is compulsory  
All questions carry equal marks*

- 1 (a) State true or false giving a suitable explanation
- (i) Galactose operon is transcribed even in the presence of glucose
  - (ii) Rifampicin is a translational inhibitor
  - (iii) The Cro repressor is needed for lysogenic cycle
  - (iv) Attenuation is also controlled by translation
- (2×4=8)

P T O

(b) Write down the contributions of the following scientists in the field of molecular biology

(i) Fire and Mellow

(ii) Nirenberg and Matthaei

(iii) Zinder and Lederberg

(iv) C Venkatraman (1×4=4)

2 Write short notes on **any three**

(i) Eukaryotic RNA polymerases and their promoters

(ii) Yeast mating switch

(iii) Specialized transduction

(iv) Bacterial transcription termination (3×4=12)

3 Write the function of the following (**any twelve**)

(i) TFIIH

(ii) Ruv C

(iii) RISC

(iv) rpo H

(v) EF-G

(vi) PABP

(vii) Kozak sequence

- (viii) RF - 1
  - (ix) ERE elements
  - (x) IRES
  - (xi) Copia
  - (xii) RNase H
  - (xiii) Tus protein
  - (xiv) DNA polymerase I (1×12=12)
- 4 (a) Differentiate between the replication initiation in prokaryotes and eukaryotes (4)
- (b) Termination of mRNA synthesis is combined with polyadenylation in eukaryotes Explain (4)
- (c) What is the difference between replicative and non-replicative transposition ? (3)
- (d) Why is liver microsomal fraction used in Ames test ? (1)
- 5 (a) 16S rRNA plays an active role in protein synthesis Explain (2)
- (b) How is competence induced in bacterial cells for DNA uptake ? (2)
- (c) Number of proteins in a human cell is much higher as compared to its genes Explain (3)

- (d) Name the amino acids that are generally phosphorylated. What is the function of phosphorylation of proteins? (3)
- (e) What are the properties of  $2\mu$  plasmids of *Saccharomyces cerevisiae*? (2)
- 6 (a) What are the reasons for spontaneous mutations? (3)
- (b) How are t-RNAs charged correctly with their respective amino acids by acyl t-RNA synthetases? (3)
- (c) How are the errors incorporated during replication repaired? (3)
- (d) What types of mutations are generated by acridine orange and alkylating agents? (3)
- 7 Write in brief about the following
- (i) Catabolite repression
- (ii) Regulation of plasmid copy number
- (iii) Conditional mutations
- (iv) Tn 10
- (v) t-RNA suppressors
- (vi) Mutator genes (2×6=12)