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996

Your Roll No. ....

B.Sc. (Hons.) / III

C

BIOCHEMISTRY – Paper XII

(Molecular Biology – II)

General Expression & Recombinant  
DNA Technology

(Admissions of 2000 and 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, including  
Question No. 1 which is compulsory.*

I. (a) Fill in the blanks :

- (i) The first codon discovered by Nirenberg and Matthei was \_\_\_\_\_ .
- (ii) Mutation that changes a codon specifying one amino acid to a chain termination codon is called as \_\_\_\_\_ .
- (iii) RNA particles are made up of \_\_\_\_\_ .

P.T.O.

(iv) Lac operon is an example of \_\_\_\_\_ .

(v) The site where repressor binds is called \_\_\_\_\_ .

(b) Differentiate

(i) Prokaryotic and eukaryotic mRNA

(ii) Intron and Exon

(c) Give significance of

(i) CRP

(ii) 5'cap

(d) Write down the composition of 30s and 50s ribosome subunits. (5,5.4.2)

2. (a) Comment on

(i) *E. coli* is the workhorse of molecular biology

(ii) Mitochondria and chloroplast have their own genes

(iii) Enhancers control transcription at a distance

(iv) There are three possible reading frames that exist

(v) Housekeeping genes are switched on all the time

- (b) Name one amino acid which does not have an assigned codon. (10.1)
3. (a) What are the different types of RNA polymerases in eukaryotes. Explain the role of each in eukaryotic transcription ?
- (b) Compare and contrast the process of translational initiation in prokaryotes and eukaryotes. (5.5×2)
4. (a) What is the Wobble hypothesis ?
- (b) Explain the process of aminoacyl tRNA formation.
- (c) How does frame shift mutation occur ? What is its role ? (4.4.3)
5. (a) What is positive regulation in gene expression of prokaryotes. Explain with an example.
- (b) Describe the prokaryotic transcriptional initiation ? (5.5×2)
6. (a) What is the relationship of intron and exon sequences with respect to the final mRNA formation in eukaryotic post translational processing ?
- (b) Explain in detail translational termination in bacteria. (5.5×2)
- P.T.O.

7. (a) With respect to tRNA structure, explain

(i) Stems and loop

(ii) Anticodon arm

(b) Explain

(i) RNA interference

(ii) Attenuation

(iii) Alternative splicing

(iv) Insertional inactivation

(3.8)

8. Write short notes on any two :

(i) TATA-binding protein

(ii) Cro and CI repressors

(iii) Leucine zippers

(iv) Histones in chromatin remodelling

(5.5×2)