D: 24/8/16

BIOTECHNOLOGY-III S.Y.B.Sc. SEM IV EXAM MARKS 75 $2^{1/2}$ HRS (70)

- **All questions are compulsory.**
- **Draw diagram wherever necessary**

Q I.(A) Explain the following: (any four) (08)

1. Holoenzyme
2. Promoter proximal elements
3. Pre – mRNA
4. Enhancers
5. core promoter
6. Polycistronic mRNA
7. 'TATA' box
8. Sigma factor

QI.(B) Answer the following: (any two). (12)

1. Elaborate on the E.coli RNA polymerases.
2. In detail explain the Rho dependent termination of transcription in prokaryotes
3. Describe how the intervening sequence of prokaryotic pre- mRNA are removed.
4. Explain the transcription initiation process in eukaryotes.

QII. (A) Explain the following: (any four) (08)

1. Translation
2. Aminoacylation
3. Polysome
4. Release factors (Rf)
5. Amino acyl (A) site
6. Wobble hypothesis
7. Degeneracy of code
8. Formyl methionine (fMet)

QII. (B) Answer the following: (any two) (12)

1. Explain the process of formation of initiation complex in translation of *E.coli*.
2. How does the step elongation in protein synthesis take place? Give the role of all the factors involved in it.
3. In brief explain the amino acylation of tRNA with diagram.
4. Write down the different characteristics of the genetic code.

Contd/...2

Q III (A) Fill in the blanks : (any four) (04)

1. In an SDS-PAGE

A. proteins are denatured by the SDS

B. proteins have the same charge-to-mass ratio

C. smaller proteins migrate more rapidly through the gel

D. all of the above

2. Proteins can be visualized directly in gels by

A. staining them with the dye

B. using electron microscope only

C. measuring their molecular weight

D. none of these

3. In isoelectric focusing, proteins are separated on the basis of their

A. relative content of positively charged residue only

B. relative content of negatively charged residue only

C. size

D. relative content of positively and negatively charged residue

4. In a native PAGE, proteins are separated on the basis of

A. net negative charge

B. net charge and size

C. net positive charges size

D. net positive charge

5. Proteins are separated in an SDS-PAGE experiment on the basis of their

A. positively charged side chains

B. molecular weight

C. negatively charged side chains

D. different isoelectric points

6. What is ethidium bromide ?

A. buffer
B. dye
C. DNA
D. restriction enzyme

Contd/...3

7. In agarose gel electrophoresis, the DNA is moved towards the

A. cathode
B. anode
C. DNA doesn't move
D. none of above

8. PAGE is a technique of separation of _____ based on their molecular weight and charge density.

A. Proteins
B. DNA
C. RNA
D. Amino acids

B) Give significance of the following (Any Two) (04)

i) ETBr ii) electrodes iii) tracking dye iv) Gel Loading Buffer

C) Answer the following (Any Two) (12)

1. Explain the factors affecting electrophoretic mobility.
2. Mass to charge ratio affects the electrophoretic mobility.
3. Expalin the SDS PAGE for protein separation.
4. Explain principle and uses of electrophoresis in biotechnology.

Q. 4. Write Short Notes on. (Any Three) (15)

i) Rho-independent termination of transcription
ii) reverse transcription
iii) buffers used in electrophoresis
iv) Termination of Translation
v) Protein Gel Staining
vi) Factors affecting electrophoresis

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