

[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 1557

C

Roll No.....

Unique Paper Code : 223451

Name of the Course : B.Sc. Prog.

Name of the Paper : Molecular Biology (LSPT-407)

Semester : IV

Duration : 3 Hours

Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer five questions in all, including Q. No. 1 which is compulsory.
3. Illustrate your answers with appropriate diagrams wherever necessary.

1. (a) Define the following :

- (i) Plasmid
- (ii) Metastasis
- (iii) Polysomes
- (iv) Transfection
- (v) Central Dogma
- (vi) Ribozyme

(6)

(b) Expand the following :

- (i) TNF
- (ii) LINES
- (iii) ESC
- (iv) miRNA
- (v) PDGF

(5)

(c) Differentiate :

- (i) B-DNA and Z-DNA
- (ii) Euchromatin and Heterochromatin
- (iii) rRNA and tRNA
- (iv) Regulator and Operator

(6)

(d) Write the major contribution of the following Scientists :

- (i) Meselson and Stahl

P.T.O.

- (ii) Nirenberg and Khorana
- (iii) Erwin Chargaff
- (iv) Frederick Griffith
- (v) Rosalind Franklin (5)

(e) Match the following :-

- |                                   |                        |
|-----------------------------------|------------------------|
| (i) Attenuation                   | (A) Telomere           |
| (ii) Helicase                     | (B) Stop Codon         |
| (iii) UAG                         | (C) Replication        |
| (iv) SnRNP                        | (D) Tryptophan operon  |
| (v) Anticodon                     | (E) DNA unwinding      |
| (vi) Okazaki Fragments            | (F) tRNA               |
| (vii) RNA primers                 | (G) Spliceosome        |
| (viii) Heterochromatin            | (H) DNA Packaging      |
| (ix) Non Histone Protein Scaffold | (I) Transcription      |
| (x) RNA Polymerase                | (J) Lagging Strand (5) |

2. (i) Discuss the double helical model of DNA as proposed by Watson and Crick.  
 (ii) Give an account of eukaryotic DNA packaging into chromosomes. Support your answer with suitable diagrams. (6+6)

3. Describe different types of RNA polymerases. Explain in detail the mRNA transcription in eukaryotes. (12)

4. (i) Explain in detail the working of Lac-operon in prokaryotes.  
 (ii) Differentiate between the inducible and repressible operon system. Discuss attenuation in detail. (6+6)

5. Describe the process of initiation, elongation and termination of the polypeptide chain in the prokaryotes. (12)

6. (i) Explain molecular mechanisms regulating caspase activity during apoptosis.  
 (ii) Discuss the role of oncogenes. (6+6)

7. Write short notes on any **THREE** : (4+4+4)

- (i) Stem cells and their applications
- (ii) Wobble Hypothesis
- (iii) Bacterial Transformation
- (iv) Carcinogens
- (v) Post-transcriptional modifications

(2000)