

(ii) Linking number

(iii) Thymine dimer

(iv) RNA primer

(v) Nuclear scaffold

(vi) T_m (5)

(c) Fill in the blanks :

(i) A codon consists of _____ nitrogenous bases.

(ii) _____ enzyme joins broken phosphodiester backbone.

(iii) _____ was the first Ribozyme isolated.

(iv) _____ histone is not a part of core particle of nucleosome.

(v) Proofreading is a unique activity shown by _____ enzyme. (5)

2. (a) Write short notes on :

(i) Clover leaf model of t-RNA

(ii) Rolling circle mechanism of DNA replication

(iii) Point mutations (3×3=9)

(b) Illustrate DNA packaging in eukaryotes with the help of well labelled diagrams. (6)

3. Differentiate between the following :

(i) B-DNA and Z-DNA

- (ii) Purines and Pyrimidines
 - (iii) Euchromatin and Heterochromatin
 - (iv) Deamination and Depurination
 - (v) Topoisomerase I and Topoisomerase II (3×5=15)
4. (a) Give a brief account of experiments, which helped in deciphering the Genetic Code.
- (b) What is reassociation kinetics and how can it be used to plot the cot curve. Give its implications.
- (c) Explain the key experiment that demonstrates the semi-conservative nature of DNA replication. (5×3=15)
5. (a) How are the chromosome ends replicated, specially the lagging strand? (5)
- (b) Give a detailed description of the events occurring at the Y- fork or replication fork in *E. coli*. (10)
6. (a) Describe any two experiments demonstrating DNA as the carrier of genetic information. (6)
- (b) Explain Chargaff's base equivalence rule. (3)
- (c) Compare and contrast three biological repair mechanisms of errors in DNA replication. (6)
7. (a) Explain organization of chromosomal and extra-chromosomal DNA in bacteria and genome in viruses. (8)

- (b) What is degeneracy and polarity in genetic code ? (4)
- (c) A covalently closed circular DNA molecule (ccc DNA) of 360 bp size has 36 twists and 4 negative supercoils. Determine the linking number of this molecule. (3)