**Bachelor of Science (B.Sc.) Semester—V (C.B.S.) Examination**

**BIOTECHNOLOGY**

**(Molecular Biology)**

**Paper—1**

Time : Three Hours] [Maximum Marks : 50

**N.B. :—** (1) **All** questions are compulsory and carry equal marks.
(2) Draw well labelled diagrams and give examples wherever necessary.

1. Describe in detail the initiation process of replication in prokaryotes. 10

**OR**

(a) Write a note on proof for semiconservative replication. 5

(b) Describe DNA polymerase III holoenzyme. 5

2. Discuss in detail type of gene mutation. 10

**OR**

(a) What are mutagens ? Discuss chemical mutagens. 5

(b) Give an account on Nucleotide Excision Repair. 5

3. (a) Write a note on abortive initiation. 2½

(b) Give the structure and significance of prokaryotic promoter. 2½

(c) Write a note on chain elongation. 2½

(d) Write a note on $\sigma$ factor. 2½

**OR**

Describe the initiation process of prokaryotic transcription. 10

4. Describe lac operon in detail. 10

**OR**

(a) Describe the role of CRP and cAMP in lac operon. 5

(b) Describe the role of attenuator in trp operon. 5

5. Solve any **TEN** of the following :

(i) Name the protein which is associated with DNA-B helicase.

(ii) What is the role of topoisomerases in DNA replication ?

(iii) $3' \rightarrow 5'$ activity of DNA polymerase is also called as _____ activity.

(iv) Name any one type of physical mutagen.

(v) What is meant by 'AP' in AP endonuclease ?

(vi) Name the most common type of DNA damage caused by UV radiations.

(vii) Name the subunit composition of prokaryotic RNA polymerase core enzyme.

(viii) Write the concensus sequence of pribnon box.

(ix) What is the role of Nus A ?

(x) What is meant by gratuitous inducer ?

(xi) What is the role of operator in operon ?

(xii) Name the enzymes involved in lactase metabolism. 1×10=10