B.Sc. (Part—III) Semester—V Examination

BIOCHEMISTRY

(Molecular Biology and Biotechnology)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) All questions are compulsory and carry equal marks except Q. No. **1** which carries **8** marks.

(2) Draw neat and labeled diagram wherever necessary.

1. (A) Fill in the blanks :

(i) Nucleic acids are polymers of _ _____ . ½

(ii) During translation the enzyme involved in activation of amino acid is _____ . ½

(iii) _____ is a DNA joining enzyme. ½

(iv) The process of RNA synthesis is known as _____ . ½

(B) Choose the correct alternative :—

(i) The nitrogenous base not present in DNA is : ½

(A) Adenine (B) Guanine

(C) Uracil (D) Thymine

(ii) Which one of the following is not involved in initiation of translation ? ½

(A) IF_1 (B) IF_2

(C) EF-TU (D) IF_3

(iii) Which of the following subunit of RNA polymerase searches a promoter sequence : ½

(A) Sigma (B) Alpha

(C) Beta (D) Delta

(iv) The number of base pairs present in each turn of B-DNA are : ½

(A) 9 (B) 10

(C) 11 (D) 12

(C) (i) Define transgenic plants. 1

(ii) Define Primary cell culture. 1

(iii) Define translation. 1

(iv) Define Totipotency. 1

2. (a) Describe in brief Watson and Crick double helical model of DNA. 4

(b) Explain features of Viral genome. 4

(c) Describe current version of central dogma of molecular genetics. 4

OR

(p) Explain structure and function of r-RNA. 4

(q) Discuss features of Prokaryotic genomes. 4

(r) Discuss in brief Hershey and Chase experiment. 4

3. Describe with suitable diagram initiation, elongation and termination of transcription. 12

OR

Explain the role of enzyme and proteins involved in DNA replication with a suitable diagram and add a note on experimental evidence for semiconservative DNA replication. 12

4. Describe in detail translation in Prokaryotes. 12

OR

Discuss in detail lac operon and add a note on overlapping genes. 12

5. (a) Explain Sanger method for sequencing of DNA. 4

(b) Explain the role of DNA ligase in Recombinant DNA technology. 4

(c) Describe in brief Northern blotting. 4

OR

(p) Describe COSMID vectors. 4

(q) Discuss electroporation. 4

(r) Explain shuttle vectors. 4

6. (a) Describe growth kinetics of cell in culture. 4

(b) Explain importance of growth factors of serum. 4

(c) Discuss History of animal cell culture. 4

OR

(p) Discuss in brief application of animal cell culture in study of gene expression. 4

(q) Explain organ culture. 4

(r) Describe in brief primary and secondary cell culture. 4

7. (a) Describe media prepration and composition for plant tissue culture. 4

(b) Discuss any four practical applications of Plant tissue culture. 4

(c) Discuss ovule culture. 4

OR

(p) Give any four practical applications of genetic transformation in plants. 4

(q) Explain suspension culture. 4

(r) Describe in brief in vitro pollination and fertilization. 4