AW–1732

**B.Sc. (Part—II) Semester—IV Examination**

**BIOINFORMATICS**

**(Fundamentals of Molecular Biology and Immune System)**

Time : Three Hours] [Maximum Marks : 80

**Note :—** (1) **All** questions are compulsory.

(2) Draw well labelled diagram wherever necessary.

1. (a) Fill in the blanks :

(i) The bacterial system has _____ DNA polymerases.

(ii) The site of protein synthesis is _____.

(iii) _____ Immunoglobulin is the principal one found in secretions such as milk.

(iv) The smallest unit of antigenicity is known as _____. 2

(b) Choose the correct alternatives :

(i) The bacterial system has _____ RNA polymerases.

(a) 1 (b) 2

(c) 3 (d) 4

(ii) All of the following are true of antigen except which one of the following ?

(a) They contain epitopes (b) They will react with antibodies

(c) They contain paratopes (d) They can elicit an immune response

(iii) Which of the following is not true for process of DNA replication ?

(a) Semiconservative (b) Semidiscontinuous

(c) Unidirectional (d) Priming

(iv) The most common type of white blood cells is :

(a) Eosinophil (b) Neutrophil

(c) Basophil (d) Lymphocyte 2

(c) Answer in **one** sentence each :

(i) Role of topoisomerase in DNA replication process.

(ii) Define Vaccine.

(iii) What is Paratope ?

(iv) Name the DNA polymerase involved in replication process of prokaryotes. 4

2. Explain :

(a) Initiation of DNA replication process in prokaryotes. 4

(b) Transposable element in maize/corn. 4

(c) Mitochondrial genome organization. 4

**OR**

(p) General features of DNA replication process. 4

(q) DNA Polymerase III holoenzyme. 4

(r) Features of A and B forms of DNA. 4

3. What is genome ? Describe in detail any two genome sequencing methods. 12



**OR**

Describe the structure of Lac operon. Explain in detail Positive and Negative regulation of Lac operon. 12

4. Explain in detail initiation, elongation and termination of translation process in prokaryotes. 12

**OR**

Define translation process. Describe in detail regulation of translation in eukaryotes. 12

5. Explain :

(a) Structure and function of IgG. 4

(b) Precipitation reaction. 4

(c) Role of lymph nodes in immunity. 4

**OR**

(p) Structure and function of IgE. 4

(q) Haem-agglutination reaction. 4

(r) Role of thymus gland in immunity. 4

6. Explain :

(a) Lymphocyte trafficking. 4

(b) Activated killer cells. 4

(c) Humoral Immunity. 4

**OR**

(p) Cell mediated immunity. 4

(q) MHC. 4

(r) Role of Dendritic cells in immunity. 4

7. Describe :

(a) T-Lymphatic response 4

(b) Interferons and their applications. 4

(c) Theory of precipitation reaction. 4

**OR**

(p) B-Lymphatic response. 4

(q) Interleukins and their applications. 4

(r) Theory of agglutination reaction. 4