4/H–77 (iv) (Syllabus–2015)

2022

(May/June)

BIOTECHNOLOGY

(Honours)

(Molecular Biology and Immunology)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** which is compulsory and *any* **four** from the rest

1. Explain the following in brief : 3×4=12

(a) Griffith's experiment highlighting its importance in molecular biology

(b) Two helices with same number of base pairs may have different melting points

(c) Biological consequences of complement activation

(d) Unlike Tc cells, natural killer (NK) cells can kill IgG coated target cells

2. *(a)* "Genetic code is universal." Justify this statement. 5

(b) Explain the concept of constitutive and inducible genes with suitable examples. 6

3. *(a)* Discuss post-transcriptional modification of mRNA in eukaryotes. 6

(b) Give an account on the production of monoclonal antibodies. 5

4. Compare and contrast the following : 2½+2½+2+2+2=11

(a) Primary and Secondary immune responses

(b) DNA polymerase and RNA polymerase

(c) B cell receptors and T cell receptors

(d) CD4 and CD8 T cells

(e) Leading strand and Lagging strand

5. Write on the fundamental differences between prokaryotic and eukaryotic transcription. 11

6. *(a)* Describe maturation, activation and differentiation of B lymphocytes. 6

(b) Enumerate the functions of enzymes involved in DNA replication. 5

7. *(a)* What do you understand by MHC? Discuss the structure and functions of class I and class II MHC molecules. 1+5=6

(b) Define cytokine, monokine and lymphokine. Briefly state the role of interleukines in overall immune regulation. 1½+3½=5

8. *(a)* Ribosomes play a key role in protein synthesis. Explain. 6

(b) Describe the alternate pathway of complement activation. 5

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