

**FACULTY OF SCIENCE****M. Sc. III – Semester Examination, December 2019****Subject : Biochemistry****Paper – I : Gene Regulations and Genetic Engineering****Time : 3 Hours****Max. Marks: 80**

**Note : Answer all questions from Part–A and Part–B. Each question carries 4 marks in Part–A and 12 marks in Part – B.**

**PART – A (8 x 4 = 32 Marks)**  
**(Short Answer Type)**

- 1 What is an Operon?
- 2 Explain riboswitch.
- 3 What are siRNAs?
- 4 RNA stability and transport.
- 5 Enzymes used for recombinant DNA.
- 6 Expression vectors.
- 7 Explain yeast two hybrid system.
- 8 What are reporter genes?

**PART – B (4 x 12 = 48 Marks)**  
**(Essay Answer Type)**

- 9 (a) Explain in detail the function of dual promoters in gal operon and dual repressor in ara operon with well labeled suitable diagrams.  
**OR**  
(b) Explain the lytic / lysogeny switch in the control of transcription in lambda phage with a diagram. What is anti-termination in lambda phage?
- 10 (a) Write in detail about the control of transcription in Eukaryotes.  
**OR**  
(b) Write short notes on each of the following:  
(i) Active and inactive forms of chromatin  
(ii) Histone acetylation
- 11 (a) Explain in detail with suitable diagrams sequencing of DNA by the Maxam-Gilbert and Sanger's method.  
**OR**  
(b) Write note on each of the following for DNA sequencing by pyro sequencing:  
(i) Solexa (ii) SoLiD
- 12 (a) Write short note on the following techniques. Use diagrams.  
(i) Phage display technique  
(ii) Random amplification of polymorphic DNA  
**OR**  
(b) What is heterologous gene expression? Explain with examples and diagrams for gene expression using bacteria and yeast cells.

**FACULTY OF SCIENCE**

M. Sc. III – Semester Examination, December 2019

Subject : Biochemistry

Paper – II : Immunology and Immuno Technology

Time : 3 Hours

Max. Marks: 80

Note : Answer all questions from Part–A and Part–B. Each question carries 4 marks in Part–A and 12 marks in Part – B.

**PART – A (8 x 4 = 32 Marks)**  
(Short Answer Type)

- 1 Super antigens
- 2 Organs of immune system
- 3 Humoral immune response
- 4 Graft Vs host disease
- 5 ADA deficiency
- 6 Immunosuppressive drugs
- 7 Western blotting
- 8 Ouchterlony technique

**PART – B (4 x 12 = 48 Marks)**  
(Essay Answer Type)

- 9 (a) Write an essay on structure and biological properties of immunoglobulins.  
OR  
(b) Give theories of antibody formation. Add note on antibody diversity.
- 10 (a) Describe structure and functions of MHC proteins.  
OR  
(b) Give an account of cytokines in immune response.
- 11 (a) Write an essay on types of hypersensitivity.  
OR  
(b) Describe in detail different types and applications of Vaccines.
- 12 (a) Describe in detail different types and applications of Vaccines.  
OR  
(b) Write short notes on :
  - (i) RIA
  - (ii) FACS technique

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