

FACULTY OF SCIENCE
M. Sc. II – Semester Examination, May / June 2019

Subject : Biochemistry

Paper – I
Enzymology

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. Role of TPP and FMN as vitamin co-factors.
2. Specific activity of enzyme.
3. Quasi steady state approximation.
4. Enzyme hysteresis.
5. Catalytic mechanism of Subtilisin.
6. Acid base catalysis.
7. Application of cellulases in detergent and paper industry.
8. Reporter enzymes for gene expression.

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

- 9 (a) Describe with an example the biological significance of coupled enzyme reaction.
OR
(b) Describe the role of various environmental factors affecting catalysis.
- 10 (a) What is enzyme co-operativity? Compare MWC model and KNF model regarding this.
OR
(b) Describe various types of bi-substrate reactions with examples.
- 11 (a) Describe the different mechanisms in the regulation of the enzyme Glutamine Synthetase.
OR
(b) Describe with suitable example, how an enzyme can be activated by ligand binding and dimerization.
- 12 (a) Describe the enzymatic regulation in various stages of TCA cycle.
OR
(b) Give an account of regulatory enzymes in purine bio-synthesis pathway, and their pathological significance.

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M. Sc. II – Semester Examination, May / June 2019

Subject: Biochemistry

Paper – II

Molecular Biology

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 Replisome.
- 2 Telomerase.
- 3 NHEJ DNA repair.
- 4 DNA repair by photo – reactivation.
- 5 Inhibitors of transcription.
- 6 Wobble hypothesis.
- 7 Immuno proteosomes.
- 8 N-linked glycosylation.

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

- 9 (a) Give a detailed account of the initiation of DNA replication in prokaryotes and eukaryotes.
OR
(b) Discuss the structural composition of DNA polymerases in prokaryotes and their role in DNA replication.
- 10 (a) Explain in detail about short and long patch of base excision repair.
OR
(b) Discuss about DNA repair by homologous recombination. Quote an example.
- 11 (a) Discuss on the nature of genetic code and its salient features.
OR
(b) Explain the steps involved in initiation process of translation in prokaryotes and eukaryotes.
- 12 (a) Discuss on ubiquitin – proteosomal pathway of protein degradation.
OR
(b) Explain the role of chaperones in protein folding.

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Subject : Biochemistry
Paper – III
Biochemical Genetics and Model Organisms

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. Extra-chromosomal inheritance.
2. Somatic vs germline mutation.
3. Interference.
4. Cytological proof of crossing over.
5. Mapping bacterial genes by transformation.
6. Discovery of transposition.
7. Why is *Danio* a model organism?
8. One gene-one enzyme hypothesis.

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

- 9 (a) What is meiosis? Explain its role in genetic variation.
OR
(b) Discuss about: (i) types of gene interactions (ii) site directed mutagenesis.
- 10 (a) With suitable examples describe the importance of pedigree analysis in human genetics.
OR
(b) Give an account on: (i) tetrad analysis (ii) Any two mobile genetic elements.
- 11 (a) Explain the mapping of bacterial genes by conjugation.
OR
(b) Give an account on mapping of phage genes by complementation and deletion analysis.
- 12 (a) Describe the significance of *Xenopus* as a model organism.
OR
(b) Why *Arabidopsis* serves as a model organism to study flower development? Explain.

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Subject : Biochemistry
Paper – IV : Endocrinology and Metabolic Disorders

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 (8X4=32 Marks)
(Short Answer Type)

1. Classification of hormones by mechanism of action
2. Anterior pituitary hormones
3. Menopause
4. Adipocytokines
5. Alcaptonuria
6. Galactosemia
7. Down syndrome
8. Niemann-Pick disease

PART – B (4x12=48 Marks)
(Essay Answer Type)

9. (a) Explain the action of gonadal hormones.
OR
(b) Describe the basic mechanisms of action of steroid hormones and receptors.
- 10.(a) Explain the endocrine regulation of renal function.
OR
(b) Describe the endocrine mechanisms of calcium homeostasis.
- 11.(a) Explain the disorders of tyrosine metabolism.
OR
(b) Explain the basis of genetic and acquired causes of glycogen storage diseases.
- 12.(a) Write short notes on (i) Krabbe disease (ii) Lesch-Nyhan syndrome.
OR
(b) Write short notes on (i) Hereditary Xanthinuria (ii) Hyperuricemia.

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