

(BIT 10111)

**M.Sc. DEGREE EXAMINATION,
NOVEMBER/DECEMBER 2015.**

First Semester

Biotechnology

Paper I — GENETICS AND CELL BIOLOGY

(Regulation 2011)

Time : Three hours

Maximum : 70 marks

Answer ONE question from each Unit.

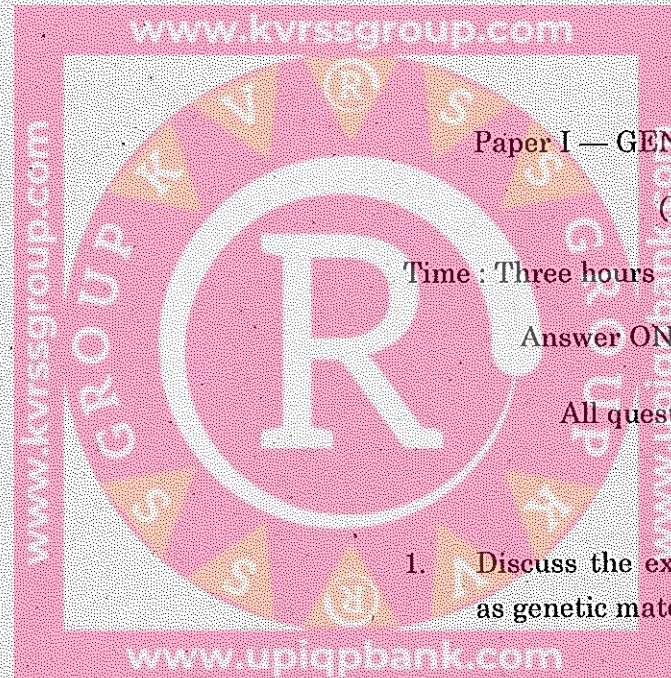
All questions carry equal marks.

UNIT I

1. Discuss the experimental evidence to prove DNA as genetic material.

Or

2. Write notes on :
 - (a) Modern concept of gene.
 - (b) Sex – linked inheritance.



UNIT II

3. Explain the mechanism of conjugation.
Or

4. Write notes on :
(a) Genetic recombination.
(b) Transduction.

UNIT III

5. Give an account on the ultra structure of a Eukaryotic cell.

Or

6. Write notes :
(a) Endoplasmic reticulum.
(b) Chloroplast.

UNIT IV

7. Explain the Eukaryotic cell cycle and its regulation.

Or

8. Write notes :
(a) Euchromatin and heterochromatin.
(b) Necrosis.

UNIT V

9. Discuss the structure and functions of cytoskeleton.

Or

10. Write notes :
(a) Cell surface receptors.
(b) Intracellular signaling proteins.

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Paper II — BIOMOLECULES

(Regulation 2011)

Time : Three hours

Maximum : 70 marks

Answer ALL questions.

All questions carry equal marks.

UNIT I

1. Elaborate on the classification of carbohydrates.

Or

2. Write notes on :

- (a) Amino sugars.
- (b) Bacterial cell polysaccharides.



UNIT II

3. Write the chemical structures and physicochemical properties of amino acids.

Or

4. Write notes on :

- (a) Denaturation of proteins.
- (b) Glutathione cyclic antibiotics.

UNIT III

5. Describe different levels of structural organization of proteins.

Or

6. Write notes on :

- (a) Biological function of myoglobin.
- (b) Ramachandran plot.

UNIT IV

7. Describe chemical structures and biological role of prostaglandins.

Or

8. Write notes on :

- (a) Sphingolipids.
- (b) Chlorophylls.

UNIT V

9. Write the chemical structures of purines and pyrimidines and physico-chemical properties of nucleic acids.

Or

10. Write notes on :

- (a) Structure of DNA.
- (b) Hyperchromic effect.

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Paper III — TOOLS AND TECHNIQUES IN BIOLOGY

(Regulation 2011)

Time : Three hours

Maximum : 70 marks

Answer ALL questions.

All questions carry equal marks.

UNIT I

1. Write the basic principles of sedimentation. Explain the advantages and applications of analytical ultracentrifuges.

Or

2. What are biochemical buffers? Write about the selection of biochemical buffers in reactions. Mention the applications of biosensors.

UNIT II

3. Explain the methodology, principle and applications of High Performance Liquid Chromatography (HPLC).

Or

4. Describe the experimental procedure, working principle, instrumentation and applications of Ion-exchange chromatography.

UNIT III

5. Write the preparation of polyacrylamide gel material. Explain the principle and applications of 2D electrophoresis.

Or

6. Explain the methodology, principle and applications of pulse field gel electrophoresis.

UNIT IV

7. Describe the theory, instrumentation, working principle and applications of NMR spectroscopy.

Or

8. Explain the instrumentation, principle and applications of Optical Rotatory Dispersive (ORD) and Circular Dichroism (CD).

UNIT V

9. Describe the measurement of radioactivity using Geiger-Muller counters and Scintillation counters.

Or

10. Write the biological applications of radioisotopes.



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Paper IV — ENZYMOLOGY

(Regulation 2011)

Time : Three hours

Maximum : 70 marks

Answer ALL questions.

All questions carry equal marks.

UNIT I

1. Write an account on enzyme classification with suitable examples for each class.

Or

2. Write notes on :

- (a) Enzyme specificity
- (b) Apoenzyme
- (c) Transition state energy.



UNIT II

3. Describe various factors affecting the enzyme activity.

Or

4. Write notes on :
- Hanes plot
 - Significance of Kcat.

UNIT III

5. Write an essay on purification and criteria of purity of enzymes.

Or

6. Write notes on :
- Irreversible inhibition of enzymes
 - Turnover number.

UNIT IV

7. Describe mechanism of enzyme action of chymotrypsin and lysozyme.

Or

8. Write notes on :

- Describe acid-base catalysis and covalent catalysis of enzyme reactions.
- Proximity and orientation of the substrate.

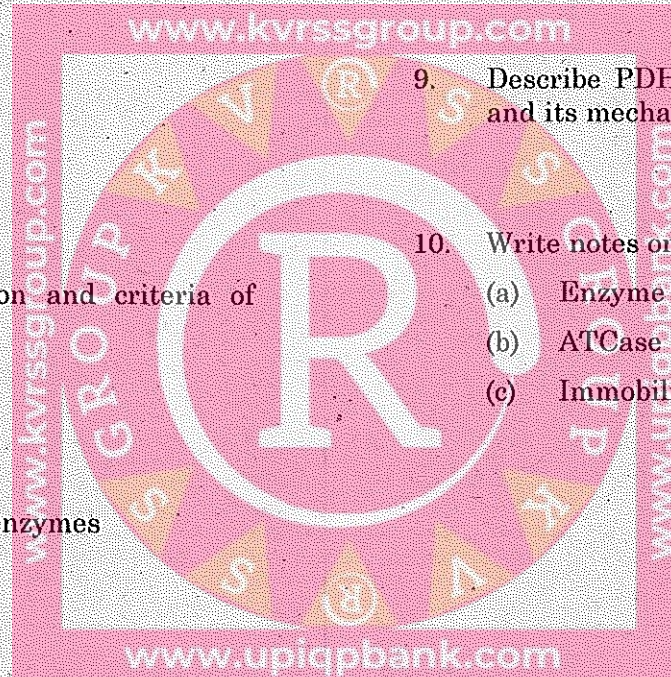
UNIT V

9. Describe PDH complex as multi-enzyme complex and its mechanism of action and regulation.

Or

10. Write notes on :

- Enzyme regulation
- ATCase
- Immobilized enzymes and their applications.



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Paper V — GENERAL MICROBIOLOGY

(Regulation 2011)

Time : Three hours

Maximum : 70 marks

Answer ALL questions.

All questions carry equal marks.

UNIT I

1. Distinguish between Prokaryotic and Eukaryotic organisms.

Or

2. Discuss the characteristics of Rickettsia and Chlamydia.

UNIT II

3. Explain the structure and function of a Prokaryotic cell wall.

Or

4. Write notes on :

- (a) Nucleoid
- (b) Ribosomes
- (c) Inclusion bodies.

UNIT III

5. Explain the mechanisms of replication in viruses.

Or

6. Discuss the general characteristics of TMV and HIV.

UNIT IV

7. Explain the methods of preservation and maintenance of microbial cultures.

Or

8. Discuss the methods of isolation and identification of bacteria.

UNIT V

9. Give an account on nutritional groups of bacteria with suitable examples.

Or

10. Discuss the physical and chemical factors influencing microbial growth.