

N-56091

Seat No. _____

M. Sc. (Part - II) Examination

April / May – 2003

Life Science : Paper - VI

**(A) Biomolecules, Biomembrane, Bioenergetics &
Environmental Life Science**

(B) Endocrinology & Reproductive Physiology

**(C) Molecular Biology & Genetics
(Elective)**

Time : 3 Hours]

[Total Marks : 100

**(A) Biomolecules, Biomembrane, Bioenergetics &
Environmental Life Science**

Instruction : All questions carry equal marks.

- 1** (a) Explain heme and non-heme.
(b) What are metallo proteins
(c) Discuss metal coordination.

OR

- 1** (a) Discuss macro molecules.
(b) Discuss enzyme action and mechanisms.
(c) Explain Metallo enzymes.
- 2** (a) What are membrane ? Discuss the membrane protein association.
(b) Write a note on A T Pases.

OR

- 2** (a) Explain membrane cytoskelal interaction.
(b) Discuss oxygen transport.
(c) Write a note on cytochrome C.

- 3** Discuss any **three** of the following :
- (a) Entropy and Enthalpy
 - (b) Free energy
 - (c) Second law of thermodynamics
 - (d) Trace metals
 - (e) Chloride - electrolytes
 - (f) Bicarbonate - electrolytes.
- 4** Discuss the principle, method and applications of any two of the following :
- (a) Laser in biology
 - (b) Radiation Therapy
 - (c) CAT
 - (d) In-vivo NMR
 - (e) Radiation in Medicine
- 5** Discuss the principle and method of estimation of the following :
- (a) Chemical oxygen demands
 - (b) Hardness of water
 - (c) Particulate matter
 - (d) Sulphurdioxide
 - (e) Biological oxygen demand
 - (f) Nitrite in water.

(B) Endocrinology & Reproductive Physiology

**NB: All questions carry equal marks.
All questions are compulsory.
Illustrate your answers with neat diagrams wherever necessary**

1. Describe: a). Sutherland's cascade phenomenon
b). Superfamily proteins

OR

1. Describe: a). Feedback mechanisms
b). Receptors
2. Describe: a). Development of genital duct system
b). Spermatogenic cycles and waves

OR

2. Describe: a). Sperm axoneme
b). Role of epididymis in sperm maturation
3. Write notes on: a). Antral and pre-ovulatory phases in folliculogenesis
b). Parturition and its control

OR

3. Write notes on: a). Hypothalamus
b). Role of pineal in reproduction
4. Describe: a). Principles of ELISA
b). Recent advances in fertility regulation in females

OR

4. Describe: a). Adenohypophysis
b). Primary lymphoid organs
5. Write short notes on **Any three** of the following:
 - a). G-proteins
 - b). Apoptosis
 - c). Menstrual cycle
 - d). Capacitation of spermatozoa
 - e). Atrial natriuretic factor
 - f). Micromanipulation

(C) Molecular Biology & Genetics

**NB: All questions carry equal marks.
All questions are compulsory.
Illustrate your answers with neat diagrams wherever necessary**

1. Write a detailed account on: a). Molecular organization of the plasma membrane
b). Sorting mechanism in the Golgi Complex

OR

1. Write a detailed account on: a). Structural chromosomal aberrations
b). Banding techniques
2. Describe: a). RNA splicing and its role in Gene expression
b). DNA modification

OR

2. Describe: a). Enzymes in DNA replication
b). Maxam and Gilbert method of DNA sequencing
3. Write notes on: a). PCR and its applications
b). Proto-oncogenes and Oncogenes

OR

3. Write notes on: a). Applications of Biotechnology in medicine
b). Gene diversity in Immunoglobulin synthesis
4. Describe: a). Cascade phenomenon
b). G-proteins and related diseases

OR

4. Describe: a). Steroid hormone receptors
b). Apoptosis
5. Write short notes on **Any three** of the following:
 - a). Properties of heterochromatin
 - b). FISH technique
 - c). Cadherins
 - d). Nitrous oxide and its role in cell signalling
 - e). C-value paradox
 - f). Peroxisomes