

## PAPER-III ENDOCRINOLOGY AND MOLECULAR CELL BIOLOGY

(Questions will be set from each unit)

### UNIT-I Endocrinology - I

- 1. Aims and scope of endocrinology :** A. Hormones as messengers. B. Hormones and eukaryotic metabolic regulation. C. Classification of hormones. D. Discovery of hormones.
- 2. Phylogeny of endocrine glands (pituitary, Pancreas, adrenal, Thyroid etc.)**
- 3. Ontogeny of endocrine glands.**
- 4. Neuroendocrine system and neurosecretion.**
- 5. General principles of hormone action :** A. Nature of hormone action. B. Hormone receptors - Signal transduction mechanisms. C. Hormones and homeostasis. D. Hormonal regulation of Carbohydrate, Protein and Lipid metabolism. E. Hormones and behaviour. F. Termination of hormone action.

### UNIT-II Endocrinology - II

- 1. Hormone Structure and evolution.**
- 2. Biosynthesis and secretion of hormones :** A. Hormones in circulation and other body fluids. B. Biosynthesis of steroid hormones de-novo.
- 3. Hormones and behaviour.**
- 4. Hormones, Growth and Development.**
- 5. Hormones and Reproduction :** A. Seasonal breeders. B. Continuous breeders.

### UNIT - III Molecular Cell Biology - I

- 1. Biomembranes :**
  - A. Molecular composition and arrangement functional consequences.**
  - B. Transport across cell membrane - Diffusion, active transport and pumps, uniports, symport and antiports.**

2. **Cytoskeleton** : A. Microfilaments and microtubules - Structure and dynamics. B. Microtubulus and Mitosis. C. Cell Movements - Intercellular transport, role of kinesin and dynein, signal transduction mechanisms.
3. **Cell - Cell signalling** : A. Cell surface receptors. B. Second messenger system. C. MDP Kinade Pathways. D. Signalling from plasma mambrane to nucleus.
4. **Cell - Cell adhesion and communication** : A. Ca<sup>++</sup> dependant. B. Ca<sup>++</sup> independant. C. Gap Junctions and connexins.
5. **Cell cycle** : A. Cyclines and cyclin dependant kinades. B. Ragulation of CDK-Cycline activity.

**UNIT-IV Molecular Cell Biology - II**

1. **Cell matrix adhesion** : A. Integrins. B. Collagen. C. Non-Collagen Components. D. Auxin - Cell Expansion. E. Cellulose fibril synthesis and orientation.
2. **Organization of Viral DNA, Bactrial DNA, Eukaryotic DNA, Palindromes, Split Genes, Transposons.**
3. **Gene Concepts and Genetic Code**
4. **Intracellular protein traffic** : A. Protein Synthesis on free and bound polysomes. B. Uptake into E.R. C. Membrance proteins, Golgi Sorting, post translational Modifications. D. Biogenesis of mitochondria and Nuclei. E. Trafficking mechanisms.
5. **Biology of Cancer.**
6. **Biology of aging.**