SESSION 2017-2018
Syllabus for Ph.D. Entrance Examination

RESEARCH METHODOLOGY
(40 multiple Choice Question of 01 mark each)

1) Ethic in research: ethical practices for research on human and animals.
2) Meaning, objective, types and significance of research. Selection and definition of research problem. Types of research design. Evaluation of time and cost of scientific research.
3) Meaning and characteristic of research hypothesis. Testing of research hypothesis. Procedure of hypothesis testing. Errors in hypothesis testing.
4) Meaning of population and sample, sample size, types of sampling, sampling techniques, sampling and non-sampling errors. Collection, analysis and interpretation of data. Merits and demerits of rating and ranking scales.
5) Meaning and sources of literature review. Significance of literature review in research.
7) Laboratory Techniques for Recognition of Endocrine Disorders: Types of assays (competitive Immunoassays, Immunometric assays, free hormone assays, chromatographic assays, mass spectrometry nucleic acid based assays), analytic validation (method comparison, precision, linearity, recovery, detection limit, reportable range, analytical interference, carry over studies, reference intervals, specimen stability, types of specimens), quality assurance, quality control.
8) Principles of Endocrinology: Endocrine Glands, Transport of hormone in blood, target cells as active participants, control of hormonal secretion. Basic concepts hormone overproduction, underproduction and altered tissue responses.
9) Molecular Cell Biology: Constituents of human cells, their structure and function, properties of cell membrane and transport across membranes. Structural aspects of genetic materials, replication and transcription, post transcriptional processing, translation, regulation of gene expression, DNA repair, epigenetic changes, Human
genomic project and its implications, principles cloning, recombinant DNA technology and its application, DNA sequencing, screening recombinant DNA libraries, gene silencing, amplification and mutagenesis, restriction and molecular genetics maps, genomics and proteomics.

10) Genetic Control of Peptide Hormone Formation: Peptide hormone and their functions, sub cellular structure of cells and that secrete protein intracellular aggregation and transport of polypeptide hormones, structure of a gene encoding a polypeptide hormone (transcriptional regions regularly regions, introns, exons), regulations of gene expression (level of gene control, tissue specific gene expression, transcriptional factor in developmental organogenesis, generation of biologic diversification (gene duplication, transcription, post-transcriptional processing, translation, post translational processing, translation, post translational processing)

11) Mechanism of Action of Hormones that Act on Nuclear Receptors: Ligands acting via nuclear receptors, nuclear signalling mechanisms (domain structure of nuclear receptor, nuclear localization, hormone binding target hormone recognition by receptor, receptor dimerization, receptor regulation of gene transcription).

12) Mechanism of Action of Hormones that Acts at the Cell Surface: Receptor regulation of hormone sensitivity, receptor tyrosine kinase, G Protein coupled receptors.

**SPECIALITY (ENDOCRINOLOGY)**
(10 Multiple Choice Question of 01 Mark each AND 3-6 descriptive of 30 maximum marks)

1. **Neuroendocrinology**: Neural control of glandular secretion, hypothalamo-pituitary unit, circumventricular organs, pineal gland, hypophysiotropic hormones and neuroendocrine axes, neuroendocrine disease.

2. **Anterior Pituitary**: Development anatomy and overview control of hormone secretion, physiology and disorder of pituitary hormone axis.

3. **Posterior Pituitary**: Anatomy synthesis and release of neurohypophyseal hormone, physiology and secretion of vasopressin and thirst, diabetes insipidus and syndrome of inappropriate antidiuretic hormone secretion.
4. **Thyroid Physiology and Diagnostic Evaluation of Thyroid Disorder**: Phylogeny, embryology and ontogeny. Anatomy and history, iodine metabolism, synthesis and secretion of thyroid hormones in peripheral tissue, regulation of thyroid functions, laboratory status of thyroid status.

5. **Adrenal Cortex**: Anatomy, adrenal steroid and steroidogenesis, corticosteroid hormone action, adrenocortical diseases.

6. **Endocrine Hypertension**: Physiology of the sympathoadrenal system, rennin angiotensin aldosterone axis.

7. **The Physiology and Pathology of the Female Reproductive System**: Reproductive Physiology, disorders of the female reproductive system.

8. **Disorder of the Testes and Male Reproductive Tract**: Development of testes, physiology of testicular function, assessment of testicular function, abnormalities of androgen metabolism and testicular function, abnormalities in estrogens metabolism.

9. **Male and Female Sexual Dysfunction**: Regulation of male and female sexual function, management of male and female sexual dysfunction.

10. **Endocrine Changes in Pregnancy**: Placental development, placental adaption to pregnancy, placental hormone production.

11. **Endocrine of Fetal Development**: Fetal Endocrine System.

12. **Disorder of Sexual Differentiation**: Normal sex determination and sex differentiation, disorders of sex differentiation.


14. **Puberty**: Ontogeny, Neuroendocrinology, Physiology and disorder.

15. **Endocrinology of Aging**.

16. **Hormones and Disorders of Mineral Metabolism**: Basic biology of mineral metabolism, Parathyroid and Calcitropic Hormones.

17. **Metabolic Disorders of Lipids, Carbohydrates and Protein and Related Disorder**: Inborn errors of metabolism, structure and function of the skeleton bone remodelling and its regulation.
18. **Diabetes Mellitus**: Epidemiology, diagnostic criteria, pathogenesis, insulin secretion, rodent models of diabetes, biochemistry and molecular cell biology of diabetic complications, physiology of systemic glucoregulation.

19. **Obesity**: Pathogenesis, energy metabolism, adipose tissue as an endocrine organ, adipocyte biology

20. **Immunoendocrinopathy Syndrome**.

21. **Gastrointestinal Hormones**.

22. **Endocrine Responsive Cancers**.

23. **Humoral Manifestation of Malignancy**.