

# **RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER**

## **SYLLABUS OF COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT PROFESSOR (Super Speciality) ENDOCRINOLOGY MEDICAL EDUCATION DEPARTMENT**

### **Unit-I - The basic science of endocrinology and metabolism:**

- History of Endocrinology, evaluation of concept of endocrine glands, hormones, intermediary Metabolism. Influence of human genome project in endocrinology.
- Types of hormones and their molecular structure.
- Regulations of synthesis and secretion of various hormones. Feedback mechanism.
- Endocrine rhythms, the sleep- wake cycle, and Biological clocks.
- Mechanism of action of various steroid and peptide hormones.
- Basic principles of Genetics, immunology and oncology as applied to clinical endocrinology and metabolism.
- Principles of endocrine measurements and Laboratory techniques: Hormonal assays: RIA, CLIA, IRMA, ELISA, LCMS HPLC, Clinical chemistry of hormone and metabolic disorders, cytogenetics, FISH, chromosomal microarray, molecular genetics and biochemical genetics of endocrine and metabolic disorders.
- Basic principles of imaging and their applications in endocrinology: Nuclear imaging including PET scan, CT, MRI, USG and conventional radiology.
- Research methodology: Design of study Epidemiology, statistical methods. Existing and Upcoming laboratory techniques in endocrinology and metabolism.
- Endocrine disruptors, environmental toxins and endocrinology.
- Dynamic endocrine tests.

### **Unit-II - Adrenal Glands:**

- Anatomy and physiology of Adrenal gland.
- Structural, biochemical and molecular pathology of various adrenal disorders.
- Genetics disorder of the adrenal cortex.
- Drugs used in treatment of adrenal disorders and diagnosis.
- Adrenal gland imaging.
- Applications of hormonal assays and other biochemical investigations in diagnosis of various adrenal disorders.
- Dynamic hormonal tests for adrenal dysfunctions.
- Epidemiology, Etiopathogenesis, diagnosis and management of various adrenal disorders like: Cushing syndrome, Addison disease, congenital adrenal hyperplasia, adrenal tumors and carcinoma,
- Endocrine hypertension- pheochromocytoma, hyperaldosteronism and other cause of endocrine hypertension etc.
- Adrenal disorders in special situations like childhood, adolescence and pregnancy.
- Genetic disorders of adrenal gland.
- Adrenal surgery

### **Unit-III - Metabolic bone disease:**

- Skeletal ultrastructure and physiology
- Bone Development and remodeling Regulation of bone mass.
- Regulation of calcium, phosphate, magnesium and vitamin D3 metabolism.
- Hormonal and metabolic investigations in bone disorders.
- Markers of skeletal metabolism.
- Radiologic assessment of metabolic bone disorders: Conventional X-rays, DEXA, Bone scan.
- Histomorphometry of metabolic bone diseases.
- Epidemiology etiopathogenesis, diagnosis and management of metabolic bone diseases like Osteoporosis, Ricketts, osteomalacia, CKD- MBD syndrome, Paget's disease, osteogenesis imperfecta, osteoporosis, Mccune Albright syndrome. Disorders of calcium, phosphate and magnesium metabolism.
- Hereditary and congenital disorders of bone and mineral metabolism.
- Genetic defect in vitamin d metabolism and action
- Bone and mineral metabolic disorders during pregnancy.

### **Unit-IV - Pituitary & Hypothalamus:**

- Embryogenesis, structure, physiology of pituitary and hypothalamus.
- Nuclei of hypothalamus and their relation with pituitary functions.
- Secretion of various releasing hormones of hypothalamus and hormones from pituitary.
- Dynamic tests for pituitary function.
- Acromegaly -Causes of growth hormone excess, their clinical presentation, work up of these patients and various modalities of treatment of patients with growth hormone excess.
- Causes of growth hormone deficiency, their genetic transmission, their presentation and treatment.
- various functional and nonfunctional Space occupying lesions in pituitary, their presentation and management eg. cushings disease, prolactinoma, craniopharyngioma, and non-functioning sellar- supra sellar masses
- Pituitary surgery
- Radiotherapy of pituitary tumors

### **Unit-V - Posterior pituitary:**

- Development and mechanism of working of posterior pituitary.
- Mechanism of control of osmolality.
- Diabetes insipidus: its definition various types, work up and management.
- Syndrome of inappropriate antidiuretic hormone (SIADH) and its presentation and management.
- Electrolyte imbalance: - Hyponatremia, Hypernatremia and Their Evaluation and Management.

## **Unit-VI - Growth disorders:**

- Causes of short stature.
- Presentation of different kind of short stature.
- Work up of patient of short stature.
- Treatment of patients of short stature along with growth hormone therapy.
- Growth hormone resistance.
- Tall Stature

## **Unit-VII - Hypopituitarism:**

- Various types including congenital, Sheehan syndrome, lymphocytic hypophysitis and other varieties. Their presentation and management.

## **Unit-VIII - Thyroid gland:**

- Development, structure, vascular supply of thyroid gland.
- Synthesis and secretion of thyroid hormones and their regulation.
- Thyroid function test including hormonal assays, antibodies.
- Nuclear and radiologic imaging of thyroid.
- Etiopathogenesis, presentation work up and management of various thyroid disorders like: Hypothyroidism, hyperthyroidism, thyroiditis, thyroid tumors and thyroid nodules including thyroid cancer.
- Graves's orbitopathy
- Radio-iodine therapy.
- Iodine deficiencies and its presentation.
- Effect of iodination of salt and development of thyroid disorders.
- Thyroid hormone resistance.
- Thyroid disorders during infancy, childhood and pregnancy.
- Non thyroidal illness syndromes
- Thyroid Nodules, Thyroid Malignancies- Evaluation and Management.
- Thyroid surgery

## **Unit-IX - Parathyroid gland:**

- Development, anatomic structures, eutopic and ectopic parathyroid glands.
- Parathyroid imaging.
- Causes, clinical presentation their evaluation and management of various parathyroid disorders like: Hypoparathyroidism, Hyperparathyroidism, Parathyroid hormone resistance and parathyroid tumors.
- Pseudohypoparathyroidism and other genetic defects of mineral metabolism
- Malignancy- Associated Hypercalcemia
- Management of hypercalcemia.
- Surgical management of parathyroid disorders

## **Unit-X - Gonads and puberty:**

- Endocrinology of sexual maturation and puberty
- Endocrinology of pubertal disorders

- Abnormal development of gonads and genitalia, their presentation, evaluation and management of various disorders like: disorders of sexual developments, delayed puberty, precocious puberty.
- Clinical presentation works up and management of various disorders like hypogonadotropic hypogonadism, hypergonadotropic, hypogonadism.
- Somatic stigmata and abnormal pubertal development, work up and management of: Turners syndrome, Klinefelter's syndrome, kallmann syndrome.
- Infertility and assisted reproduction.
- Gender dysphoria and Transgender care

### **Unit-XI - Diabetes Mellitus and Metabolic syndrome: 25 Questions**

- Definition, epidemiology, diagnosis and classification of diabetes.
- Etiopathogenesis of diabetes including, various genetic mutations for development of type 1, type 2 and MODY (Maturity onset diabetes of young), neonatal diabetes, secondary diabetes and genetic causes of diabetes
- Clinical presentation works up and management of various types of diabetes: Type 1, Type 2, Gestational diabetes, Secondary diabetes, MODY (Maturity onset diabetes of young).
- Oral drugs for management of diabetes and their classes and mechanism of action.
- Newer modalities in diabetes management including CGMS and insulin pumps.
- Newer drugs in management of diabetes like: Insulin analogues, incretin-based therapy – recent updates in GLP 1 AGONIST, dual and trisetins and new drugs in pipeline
- Stem cell therapy for diabetes
- Acute complications of diabetes
- Diabetic ketoacidosis.
- Hyperosmolar nonketotic Coma.
- Hypoglycemia.
- Chronic complications of diabetes, their prevalence, presentation, work up and management of
- Nephropathy.
- Neuropathy.
- Retinopathy.
- Peripheral vascular diseases.
- Hypertension.
- Ischemic heart disease.
- Diabetic foot disease, evaluation and management
- Surgical management of diabetic foot diseases and complication.

### **Unit-XII - Lipid Disorders:**

- Pathophysiology and various types of disorders of Lipid Metabolism.
- Management of Lipid Disorders including recent updates in pharmacotherapy.

### **Unit-XIII - Obesity:**

- Physiology of Energy Homeostasis.
- Genetics of Obesity.
- Pathophysiology of Obesity.
- Childhood Obesity.
- Obesity Syndromes.
- Clinical Features and Complications of Obesity.
- Medical and Surgical Management of Obesity.
- Recent updates in pharmacotherapy of obesity

### **Unit-XIV - Gastrointestinal Stromal Tumor (GIST):**

- Pathophysiology of pancreatic and GUT Hormones.
- Diagnosis and management of pancreatic and gut endocrine tumors.
- Gastrinoma.
- Insulinomas.
- Somatostatinomas.
- Glucagonomas.
- VIPoma.

### **Unit-XV - Endocrinology of HIV/AIDS:**

### **Unit-XVI - MEN (Multiple Endocrine Neoplasia):**

- Their types, various glands affected, their genetic transmission, presentation, treatment and management of carrier stage, Molecular diagnostics as applied to MEN.

### **Unit-XVII - Auto immune endocrinopathies:**

- Types, etiopathogenesis presentation, genetic transmission and management of various auto-immune endocrine disorders including polyglandular auto-immune syndromes.
- Fetal and neonatal endocrinology.
- Hormonal changes and pregnancy testing

\*\*\*\*\*

#### **Pattern of Question Papers:**

- 1. Objective Type Paper**
- 2. Maximum Marks: 150**
- 3. Number of Questions: 150**
- 4. Duration of Paper : 2.30 Hours**
- 5. All Questions carry equal marks**
- 6. There will be Negative Marking**  
(For every wrong answer one-third of the marks prescribed for that Particular question shall be deducted.)

\*\*\*\*\*