Paper II: Technical Subject

1. Basic Sciences
   1.1 Basic genetics
   1.2 Fetal and neonatal immunology
   1.3 Applied anatomy and embryology
   1.4 Feto-placental physiology
   1.5 Neonatal adaptation
   1.6 Development and maturation of lungs, respiratory control, lung functions, ventilation, gas exchange, ventilation perfusion.
   1.7 Physiology and development of cardiovascular system, developmental defects, physiology and hemodynamics of congenital heart disease.
   1.8 Fetal and intrauterine growth.
   1.9 Development and maturation of nervous system, cerebral blood flow, bloodbrain barrier.
   1.10 Fetal and neonatal endocrine physiology
   1.11 Developmental pharmacology
   1.12 Developmental hematology, bilirubin metabolism
   1.13 Renal physiology
   1.14 Physiology of gastrointestinal tract, digestion, absorption.
   1.15 Electrolyte balance
   1.16 Metabolic pathways pertaining to glucose, calcium and magnesium
   1.17 Biochemical basis of inborn errors of metabolism

2. Perinatology
   2.1 Perinatal and neonatal mortality, morbidity, epidemiology.
   2.2 High risk pregnancy: detection, monitoring and management.
   2.3 Fetal monitoring, clinical, electronic; invasive, and non-invasive
   2.4 Intrapartum monitoring and procedures
   2.5 Assessment of fetal risk, and decision for termination of pregnancy
   2.6 Diagnosis and management of fetal diseases
   2.7 Medical diseases affecting pregnancy and fetus, psychological and ethical considerations
   2.8 Fetal interventions.
   2.9 Fetal origin of adult disease

3. Neonatal Resuscitation
4. Neonatal Ventilation
5. Blood Gas and Acid Base Disorders
6. Neonatal Assessment and Follow Up
   6.1 Assessment of gestation, neonatal behavior, neonatal reflexes
   6.2 Developmental assessment, and follow up detection of neuromotor delay, stimulation techniques
7. **Body Systems**

7.1 **Respiratory System**
- 7.1.1 Neonatal Airways: physiology, pathology; management
- 7.1.2 Pulmonary diseases: Hyaline membrane disease, transient tachypnea, aspiration pneumonia, pulmonary air leak syndromes, pulmonary hemorrhage, developmental defects
- 7.1.3 Oxygen therapy and its monitoring
- 7.1.4 Pulmonary infections
- 7.1.5 Miscellaneous pulmonary disorders

7.2 **Cardiovascular system**
- 7.2.1 Fetal circulation, transition from fetal to neonatal physiology
- 7.2.2 Examination and interpretation of cardiovascular signs and symptoms
- 7.2.3 Special tests and procedures (Echocardiography, angiography)
- 7.2.4 Diagnosis and management of congenital heart diseases
- 7.2.5 Rhythm disturbances
- 7.2.6 Hypertension in neonates
- 7.2.7 Shock: pathophysiology, monitoring, management.

7.3 **Gastrointestinal system**
- 7.3.1 Disorders of liver and biliary system.
- 7.3.2 Bilirubin metabolism
- 7.3.3 Neonatal jaundice: diagnosis, monitoring, management, phototherapy, exchange transfusion.
- 7.3.4 Prolonged hyperbilirubinemia
- 7.3.5 Kernicterus
- 7.3.6 Congenital malformations
- 7.3.7 Necrotising enterocolitis

7.4 **Renal system**
- 7.4.1 Developmental disorders
- 7.4.2 Renal functions
- 7.4.3 Fluid and electrolyte management
- 7.4.4 Acute renal failure (diagnosis, monitoring, management).

7.5 **Endocrine and metabolism**
- 7.5.1 Glucose metabolism, hypoglycemia, hyperglycemia
- 7.5.2 Calcium disorders
- 7.5.3 Magnesium disorders
- 7.5.4 Thyroid disorders
- 7.5.5 Adrenal disorders
- 7.5.6 Ambiguous genitalia
- 7.5.7 Inborn errors of metabolism

7.6 **Hematology**
- 7.6.1 Physiology
- 7.6.2 Anemia
- 7.6.3 Polycythemia
7.6.4 Bleeding and coagulation disorders
7.6.5 Rh hemolytic disease

7.7 Neurology
7.7.1 Clinical neurological assessment
7.7.2 EEG, ultrasonography, CT scan
7.7.3 Neonatal seizures
7.7.4 Intracranial hemorrhage
7.7.5 Brain imaging
7.7.6 Hypoxic ischemic encephalopathy
7.7.7 Neuro-muscular disorders
7.7.8 Degenerative diseases
7.7.9 CNS malformation

7.8 Nutrition
7.8.1 Fetal nutrition
7.8.2 Physiology of lactation
7.8.3 Breast feeding and kangaroo mother care
7.8.4 Lactation management, breast milk banking, maternal medications and nursing
7.8.5 Parenteral nutrition
7.8.6 Vitamins and micronutrients in newborn health

7.9 Neonatal infections
7.9.1 Intrauterine infections
7.9.2 Superficial infections
7.9.3 Diarrhea
7.9.4 Septicemia
7.9.5 Meningitis
7.9.6 Osteomyelitis and arthritis
7.9.7 Pneumonias
7.9.8 Perinatal HIV

7.10 Neonatal ophthalmology
7.10.1 Developmental aspects
7.10.2 Retinopathy of prematurity
7.10.3 Sequelae of perinatal infections

7.11 Neonatal dermatology

8. Surgery and orthopedics
8.1 Neonatal surgical conditions
8.2 Pre and post operative care
8.3 Neonatal anesthesia
8.4 Metabolic changes during anesthesia and surgery
8.5 Orthopedic problems

9. Neonatal Imaging: X-rays, ultrasound, MRI, CT Scan, etc.

10. Transport of neonates