

**FACULTY OF MEDICINE
PHYSIOLOGY DEPARTMENT**

HUMAN PHYSIOLOGY SYLLABUS

PS 120

I- INTRODUCTION: (7 Lecture Hours)

- 1.1- Functional morphology of cell membrane and transport of substances across the cell membrane.
- 1.2- Body fluid: Its composition and compartments - Forces responsible for movement of substances between compartments.
- 1.3- Homeostasis and internal environment - Control mechanism - PH and buffers - Osmolality and osmotic pressure of body fluid - Units of measurement of solute concentration.
- 1.4- Regulation of ECF volume

II- AUTONOMIC NERVOUS SYSTEM: (7 Lecture Hours)

- 2.1- Subdivisions of autonomic nervous system: Sympathetic and Para-sympathetic systems - Afferent autonomic fibers - Autonomic ganglia.
- 2.2- Chemical transmission and autonomic functions - Cholinergic fibers - Cholinergic receptors (muscarinic and nicotinic) - Cholinesterase and anticholinesterase - Acetylcholine antagonists (atropine and curare) - Epinephrine and norepinephrine - Alpha and Beta receptors.
- 2.3- Higher control of autonomic nervous system: Sympathetic integration with adrenal medulla - Hypothalamic control.

III- PHYSIOLOGY OF NERVE AND MUSCLE: (14 Lecture Hours)

- 3.1- Structure and function of nerve cell – Resting membrane potential Na^+ - K^+ electrogenic pump – Action potential and its propagation – Spike potential – Types of nerve fibers and their functions – Properties of mixed nerves – Velocity of conduction in nerve fibers – Nerve growth factor – Degeneration and regeneration of nerves
- 3.2- Structure and functions of different types of muscle tissues – Differences between skeletal, smooth and cardiac muscles – Electrical phenomena and ionic fluxes – Refractory period – Molecular mechanism of muscle contraction – Source of energy for muscle contraction and role of calcium – Strength duration curve – Chronaxie – Rheobase.
- 3.3- Neuromuscular transmission – End plate potential – Drugs affecting neuromuscular junction – Myasthenia gravis
- 3.4- Function of smooth muscle – Types of smooth muscle – Contractile process and neuromuscular junction in smooth muscle
- 3.5- Isotonic and isometric contractions – Muscular fatigue – Tetanus – Twitch and clonus - Muscular atrophy and hypertrophy – Electromyography (EMG)

PHYSIOLOGY DEPARTMENT
HUMAN PHYSIOLOGY SYLLABUS

مفاضلة PS 141

I- BLOOD AND IMMUNITY (12 Lecture Hours)

- 1.1- Composition and function of blood.
- 1.2- Red blood cells: Production of RBC – Types and formation of haemoglobin – Iron metabolism – Destruction of RBC – Anaemia and Jaudice – Polycythaemia.
- 1.3- White blood cells: Genesis and properties different types and their functions – Reticule-endothelial system – Leukocytosis – Leukopenia – Leukemia.
- 1.4- Plasma proteins: Types – Origin and functions.
- 1.5- Blood groups and blood transfusion (A, B, O) bloods: Blood typing - Transfusion reaction - Rh blood groups - Rh immune response - Erythroblastosis foetalis.
- 1.6- Hemostasis and blood coagulation: Events of hemostasis and mechanism of blood coagulation - Coagulation test - Haemophilia.
- 1.7- Immunity and allergy: Types of acquired immunity - Role of lymphoid tissues – Vaccination - Passive immunity - Allergy.

II- GASTRO-INTESTINAL PHYSIOLOGY: (14 Lecture Hours)

- 2.1- Functional anatomy of gastro-intestinal tract.
- 2.2- Salivary glands – Composition and function of saliva – Mechanism of salivary secretion.
- 2.3- Mastication and deglutition.
- 2.4- Stomach – Nerve supply and functions – Gastric glands and their secretion – Emptying of stomach – Peptic ulcer.
- 2.5- Vomiting – Types and mechanism – Consequences of vomiting.
- 2.6- GIT mobility – Types, function and mechanism.
- 2.7- Pancreas – Pancreatic juice – secretion and regulation – Secretin CCK – PZ.
- 2.8- Small intestine – Intestinal secretion – Gastro-ileal reflex.
- 2.9- Liver and biliary system – Functions of liver – Composition of bile salts and their functions – Enterohepatic circulation of bile salts and bile acids – bile pigments and their metabolism – Gall bladder – Hepatic out bile and gall bladder bile – Jaudice Cholecystography.
- 2.10- Absorption in various parts of GIT – Factors affecting absorption site and mechanism of absorption of various food stuffs – Routes of absorption – Malabsorption syndromes.
- 2.11- Large intestine – Absorption of water and salts – Gastrocolic and duodenocolic reflexes – Mucous secretion – Defecation.
- 2.12- Gastrointestinal hormones and their functions.

**FACULTY OF MEDICINE
PHYSIOLOGY DEPARTMENT**

HUMAN PHYSIOLOGY SYLLABUS

إعدادي PS 141

I- INTRODUCTION: (5 Lecture Hours)

- 1.5- Functional morphology of cell membrane and transport of substances across the cell membrane.
- 1.6- Body fluid: Its composition and compartments - Forces responsible for movement of substances between compartments.
- 1.7- Homeostasis and internal environment - Control mechanism - PH and buffers - Osmolality and osmotic pressure of body fluid - Units of measurement of solute concentration.
- 1.8- Regulation of ECF volume

II- AUTONOMIC NERVOUS SYSTEM: (5 Lecture Hours)

- 2.1- Subdivisions of autonomic nervous system: Sympathetic and Para-sympathetic systems - Afferent autonomic fibers - Autonomic ganglia.
- 2.2- Chemical transmission and autonomic functions - Cholinergic fibers - Cholinergic receptors (muscarinic and nicotinic) - Cholinesterase and anticholinestrace - Acetylcholine antagonists (atropine and curare) - Epinephrine and norepinephrine - Alpha and Beta receptors.
- 2.3- Higher control of autonomic nervous system: Sympathetic integration with adrenal medulla - Hypothalamic control.

III- PHYSIOLOGY OF NERVE AND MUSCLE: (12 Lecture Hours)

- 3.1- Structure and function of nerve cell – Resting membrane potential Na^+ - K^+ electrogenic pump – Action potential and its propagation – Spike potential – Types of nerve fibers and their functions – Properties of mixed nerves – Velocity of conduction in nerve fibers – Nerve growth factor – Degeneration and regeneration of nerves
- 3.2- Structure and functions of different types of muscle tissues – Differences between skeletal, smooth and cardiac muscles – Electrical phenomena and ionic fluxes – Refractory period – Molecular mechanism of muscle contraction – Source of energy for muscle contraction and role of calcium – Strength duration curve – Chronaxie – Rheobase.
- 3.3- Neuromuscular transmission – End plate potential – Drugs affecting neuromuscular junction – Myasthenia gravis
- 3.4- Function of smooth muscle – Types of smooth muscle – Contractile process and neuromuscular junction in smooth muscle
- 3.5- Isotonic and isometric contractions – Muscular fatigue – Tetanus – Twitch and clonus - Muscular atrophy and hypertrophy – Electromyography (EMG)

IV- BLOOD AND IMMUNITY (10 Lecture Hours)

- 4.1- Composition and function of blood.
- 4.2- Red blood cells: Production of RBC – Types and formation of haemoglobin – Iron metabolism – Destruction of RBC – Anaemia and Jaudice – Polycythaemia.
- 4.3- White blood cells: Genesis and properties different types and their functions – Reticule-endothelial system – Leukocytosis – Leukopenia – Leukemia.
- 4.4- Plasma proteins: Types – Origin and functions.
- 4.5- Blood groups and blood transfusion (A, B, O) bloods: Blood typing - Transfusion reaction - Rh blood groups - Rh immune response - Erythroblastosis foetalis.
- 4.6- Hemostasis and blood coagulation: Events of hemostasis and mechanism of blood coagulation - Coagulation test - Haemophilia.
- 4.7- Immunity and allergy: Types of acquired immunity - Role of lymphoid tissues – Vaccination - Passive immunity - Allergy.

V- GASTRO-INTESTINAL PHYSIOLOGY: (10 Lecture Hours)

- 5.1- Functional anatomy of gastro-intestinal tract.
- 5.2- Salivary glands – Composition and function of saliva – Mechanism of salivary secretion.
- 5.3- Mastication and deglutition.
- 5.4- Stomach – Nerve supply and functions – Gastric glands and their secretion – Emptying of stomach – Peptic ulcer.
- 5.5- Vomiting – Types and mechanism – Consequences of vomiting.
- 5.6- GIT mobility – Types, function and mechanism.
- 5.7- Pancreas – Pancreatic juice – secretion and regulation – Secretin CCK – PZ.
- 5.8- Small intestine – Intestinal secretion – Gastro-ileal reflex.
- 5.9- Liver and biliary system – Functions of liver – Composition of bile salts and their functions – Enterohepatic circulation of bile salts and bile acids – bile pigments and their metabolism – Gall bladder – Hepatic out bile and gall bladder bile – Jaudice Cholecystography.
- 5.10- Absorption in various parts of GIT – Factors affecting absorption site and mechanism of absorption of various food stuffs – Routes of absorption – Malabsorption syndromes.
- 5.11- Large intestine – Absorption of water and salts – Gastrocolic and duodenocolic reflexes – Mucous secretion – Defecation.
- 5.12- Gastrointestinal hormones and their functions.

I- CARDIOVASCULAR PHYSIOLOGY: (21 Lectures Hours)

- 1.1- Electrophysiology of cardiac muscle – Contraction of cardiac muscle – Absolute and relative refractory periods.
- 1.2- Origin and conduction of cardiac impulse – Special conductive tissues of the heart – Rhythmic excitation of the heart – Nervous regulation of the heart – Vagal escape – Idioventricular rhythm – Abnormal rhythm of the heart – Ectopic pacemaker – Premature ventricular beat - Heart block – Circus movement – Re-entry – Cardiac arrest – Resuscitation.
- 1.3- Regulation of cardiac function – Intrinsic autoregulation of cardiac pumping – Frank-Starling law of the heart and its application to normal heart – End-diastolic volume – Heterometric and homeometric regulation – Effect of ions on heart function.
- 1.4- Cardiac cycle: Phases of cardiac cycle – Systole and diastole – Atria and ventricles as cardiac pumps – Relationships between heart rate and cardiac cycles – Pressure and volume changes in atria. Ventricles and aorta – Jugular venous pressure – Heart sounds and their cause.
- 1.5- Electrocardiogram: Characteristics of normal ECG – Various waves and intervals – Voltage and time calibration – Unipolar and bipolar leads – Cardiac vector – Mean electrical axis of the ventricle – Interpretation of ECG – Cardiac arrhythmias – ECG changes in extrasystole, heart block, flutter and fibrillation – Phonocardiogram – Echocardiogram – His bundle electrogram.
- 1.6- Cardiac output and venous return: Definitions of cardiac minute volume, stroke volume, and cardiac index – Factors affecting output – Regulation of cardiac output and stroke volume.
- 1.7- Hemodynamics: Pressure, flow and resistance, - Their inter-relationship – Hematocrit and resistance – Arterial and venous blood pressures – Effect of gravity – Vascular compliance – Critical closing pressure – Raynoll's number and turbulent flow – Poiseuille's equation – Law of Laplace and its application to the heart and capillaries.
- 1.8- Systemic circulation: Arterial and arteriolar circulation – Functional parts of circulation – Distribution of blood in various compartments – Pressure, velocity and total cross – Sectional area and their inter-relationship – Capillary circulation – Capillary dynamics and formation of tissue fluid – Starling forces, filtration pressure and edema – Active and inactive capillaries – Formation, circulation and functions of lymphatic system – Venous circulation – Venous pressure, venous pump, cardiac catheterization, central venous pressure, motor tone.
- 1.9- Microcirculation and its regulation: Local regulation of blood flow – Functional anatomy of microcirculation – Blood flow to different regions – Autoregulation of blood flow – Effect of tissue metabolism and O₂ concentration – Effect of vasodilator substance.
Vasomotor center: Vasomotor tone – Afferent impulses to vasomotor center – Stimulation of vasomotor center – Mass action effect – Emotional fainting – Vasovagal syncope – Reflex stimulation of circulation – Baroreceptor reflex – Humoral regulation of circulation – Kinins – Circulating vasoconstrictor and vasodilator substances.
- 1.10- Arterial blood pressure and its regulation: Normal values of different pressures – Physiology factors affecting arterial blood pressure – Blood pressure and age – Mean arterial blood pressure – Measurement of arterial blood pressure – Regulation of arterial blood pressure – Nervous regulatory mechanisms, peripheral

- chemoreceptors and baroreceptors – Carotid sinus reflex – CNS ischemic – Humoral regulatory mechanism – Renin-angiotensin system – Renal body fluid control system – Aldosterone control system.
- 1.11- Circulation through special regions: Pulmonary circulation: Functional anatomy of pulmonary vessels – Blood pressure in various segments of the lung – Effect of posture – Ventilation perfusion ratio – Alveolar PO₂ and vascular resistance autoregulation of pulmonary blood flow – Effect of PO₂ on pulmonary capillary membrane dynamics – Pulmonary edema – Pulmonary arterial pressure and its relationship with cardiac output and left atrial pressure – Exercise and pulmonary arterial pressure.
Coronary circulation and ischemic heart disease: Unique features of coronary circulation – Pressure gradient and flow in coronary vessels – Measurement of coronary blood flow – Control of coronary blood flow – Ischemic heart disease (atherosclerosis, angina pectoris, acute coronary occlusion, myocardial infarction). Use of beta-blockers and surgical treatment of ischemic heart disease.
Cerebral blood flow: Measurement of cerebral blood flow – Regulation of cerebral blood flow.
Cutaneous circulation: White reaction – Triple response – Reactive hyperemia – Control of skin blood flow – Cold induced vasodilatation.
- 1.12- Cardiovascular changes in exercise: Cardiac output and exercise – Arterial blood pressure and exercise – Heart rate and cardiac reserve in exercise.
- 1.13- Hypertension and circulatory shock: Definition and signs of shock – Mechanism of shock – Cardiovascular compensations of shock – Treatment of shock.

II- RESPIRATORY PHYSIOLOGY: (10 Lecture Hours)

- 2.1- Definition – Structure – Units – Symbols – Laws – Measurement of gas volumes and concentrations.
- 2.2- Intrapleural pressure – Lung volumes – Static lung compliance – Chestwall compliance – total thoracic compliance
- 2.3- Types of airflow – Airway resistance – Work of breathing.
- 2.4- The path of gas to the respiratory surface – Dead space – Alveolar ventilation – distribution of inspired gas – Regional ventilation – Measurement of uniformity of inspired gas – Distribution and mixing – Physiologic factors influencing distribution – Diffusion.
- 2.5- Blood flow in lungs – Regional distribution of blood flow – Causes of uneven distribution of blood flow – Control of pulmonary blood flow.
- 2.6- Oxygen transport – Cyanosis – Oxygen in solution – Oxyhaemoglobin dissociation curve – Carbon dioxide transport – Combined oxygen and carbon dioxide transport in blood.
- 2.7- Ventilation – Perfusion ratio and its abnormalities.
- 2.8- Respiratory rhythm – Voluntary control of muscles of breathing – Respiratory reflexes – Chemical control of breathing.
- 2.9- Effect of exercise on ventilation – Oxygen debt – Hypoxia – Asphyxia

III- RENAL PHYSIOLOGY: (11 Lecture Hours)

- 3.1- Functional anatomy of the kidney - Cortical and juxtamedullary nephrons - Blood supply of a nephron - Juxtaglomerular apparatus - Basic renal processes (filtration, reabsorption, and secretion) - Major functions of the kidney.
- 3.2- Glomerular filtration - Structure of glomerular membrane - Determinants of glomerular filtration rate (GFR) - Dynamics of GFR - Measurement of GFR - Autoregulation of GFR.
- 3.3- Plasma clearance - Calculation of plasma clearance - The Fick principle - Its application to assess renal functions - Filtration fraction - Clearance of inulin for GFR - Clearance of PAHA for RPF - Tubular of a substance - Transport maximum.
- 3.4- Tubular functions - Composition of glomerular filtrate - Tubular reabsorption - Renal handling of water - Role of antidiuretic hormone - Tubular secretion (active secretion of H^+ and passive secretion of K^+ ions; secretion of NH_3) - Tubular mechanism for reabsorption of Na^+ , K^+ , H_2O ; HCO_3^- ; urea and glucose.
- 3.5- Renal conservation of Na^+ ; Na^+ reabsorption by active process and cotransport mechanism - Na^+ transport in the distal nephron segments - Aldosterone its important and action - The rennin; angiotensin; aldosterone system - Glomerulotubular balance.
- 3.6- Renal handling of K^+ (Potassium balance); whole body distribution of K^+ ; Factors affecting K^+ excretion.
- 3.7- Mechanism of formation of concentrated and diluted urine - Changes in osmolarity of the filtrate in various parts of nephron - The medullary hyperosmolarity - The cortico-medullary gradient for total solute concentration - Medullary blood flow - Urea recirculation; Renal handling of urea - The countercurrent mechanism - Formation of diluted and concentrated urine - Osmolar clearance and free water clearance.
- 3.8- Diuresis and action of diuretics - Water diuresis and osmotic diuresis - Effect of ICF and ECF volume receptors on ADH release - Carbonic anhydrase inhibitors - Furosemide.
- 3.9- Micturition - Functional anatomy of urinary bladder - Cystometrogram during bladder filling - Micturition reflex and control by higher centre - Abnormalities of micturition - Overflow incontinence - Spastic neurogenic bladder.

I- CENTRAL NERVOUS SYSTEM: (20 Lecture Hours)

- 1.1- Introduction – Review of gross anatomy and functions of CNS – Formation and composition of CSF – Blood-brain barrier.
- 1.2- Sensory function of CNS – Modalities of sensation – Receptors, receptor potential, adaptation, stimulus strength response – Physiology of spinal cord – Ascending tracts, dorsal column, tracts, ventrolateral system, thalamus, connections and functions – Cutaneous, deep and visceral pain (referred pain) – Touch and temperature – Proprioceptor sensation – Hyperalgesia – Hyperaesthesia.
- 1.3- Reflexes – The reflex arc – General properties of reflexes – Synaptic and junctional transmission – Structure and function of synapse – Facilitation and inhibition – Electrical events in synaptic transmitter agent – Neural hormones – Neuromuscular transmission – The myoneural junction – Superficial and deep reflexes – Tendon jerks and their clinical significance.
- 1.4- Motor functions of CNS – Motor cortex and control of voluntary movement – The pyramidal and extra-pyramidal system – The internal capsule, basal ganglia, connections, functions and disorders (Parkinsonism) – Upper motor neurons and lower motor neuron lesion – Cerebellum, Connections and functions – Cerebellum lesion – Equilibrium, vestibular apparatus, function of semicircular canals – Posture, regulation of posture, postural reflexes, muscle tone, decelerate rigidity and supra-spinal regulation.
- 1.5- The hypothalamus – Connections and functions – Neuroendocrine integration – Control of autonomic functions – Limbic system and emotion hunger and thirst.
- 1.6- Higher functions of the CNS – The reticular activating system – The electrical activity of the brain – Consciousness – Sleep – Electroencephalogram (EEG) – Memory, learning, speech and judgment of behaviors.
- 1.7- Some common neurological disorders and abnormalities – transection of spinal cord (paraplegia) – Hemi section of spinal cord (Brown-squard syndrome) – Hemiplegia – Parkinsonism – Tabes dorsalis – Dorsal root and posterior column lesion – Syringomyelia.

II- ENDOCRINOLOGY AND REPRODUCTIVE PHYSIOLOGY: (14 Lecture Hours)

- 2.1- Introduction – Definition – Types of hormone – Chemistry – Mechanism of action of hormones – Hypothalamic hormones and their control of pituitary hormones – Hypothalamo-hypophyseal portal vessels – Releasing factors and inhibitory hormone – Regulation of hormone secretion.
- 2.2- The anterior pituitary gland (adenohypophysis) – Morphology and histology – Hormones of the anterior pituitary and their sources – Chemistry and action of growth hormone and prolactin – Control of growth hormone secretion – Chemistry and control of four trophic hormones – Disorders of growth hormone secretion – Gigantism – Acromegaly – Dwarfism – Panhypopituitarism.
- 2.3- The posterior pituitary gland (neurohypophysis) – Morphology and histology – Hormones secreted – Chemistry and mechanism of action – Control of secretion.
- 2.4- The thyroid gland – Morphology and histology – Hormones, synthesis, transport and metabolism of the hormones – Functions – Abnormalities of thyroid function – Anti-thyroid drugs – Thyroid function tests.
- 2.5- Parathyroid gland – Hormonal control of calcium (Ca^{++}) and phosphorus metabolism – Distribution of Ca^{++} in ECF – Ca^{++} homeostasis – Functions of ionized Ca^{++} –

- Hormones of parathyroid gland – Chemistry, source, action and control of parathyroid hormone secretion – Role of other hormones on calcium metabolism – Abnormalities of parathyroid function.
- 2.6- The adrenal gland – Morphology and histology – Chemistry, biosynthesis and action of hormones secreted by adrenal medulla and cortex – Abnormalities of their functions.
 - 2.7- The endocrine pancreas – Structure and function of islets of langerhans –Pancreatic hormones – chemistry, sources, action and control of hormones – Abnormalities of their functions.
 - 2.8- Reproductive physiology in male – Morphology and histology of tests – Spermatogenesis – Biosynthesis, chemistry and action of testosterone – Puberty – Infertility – Male sexual act.
 - 2.9- Reproductive physiology in female – Ovaries and their changes from birth to puberty – Menstrual cycle and its hormonal regulation – Chemistry, biosynthesis and action of ovarian hormones – Females sexual act.
 - 2.10- Pregnancy – Fertilization and implantation – Endocrine and physiological changes – Pregnancy tests – Placental hormones – Parturition – Lactation – Development of mammary glands – Hormonal action and control – Secretion and ejection of milk – Prevention of pregnancy – Contraceptive methods.

III- SPECIAL SENSES: (8 Lecture Hours)

- 3.1- Vision: Introduction – Physiological anatomy of eye.
- 3.2- Optics of vision: The near point of vision – Image forming mechanism – Biconcave and biconvex lenses – errors of refraction – Visual acuity – Perimeter – Binocular vision.
- 3.3- Pupillary reflexes: Light reflex and its pathway – Accommodation – Convergence reflex – Presbyopia – Argyle – Robertson pupil.
- 3.4- Photochemistry of vision: The photoreceptor mechanism – Photopic and scotopic vision – Electroretinogram (ERG) – Rhodospin and dim light vision – Dark and light adaptation – Vitamin A.
- 3.5- Neurophysiology of vision: Role of horizontal amacrine and Ganglion cells – Visual pathway – Functions of primary visual cortex – Eye movements and their control – Fusion of visual images papillary aperture – Control of papillary diameter.
- 3.6- Colour vision: Tricolour mechanism of colour reception – Types of colour blindness – Tests of colour blindness.
- 3.7- The sense of hearing: The tympanic membrane and ossicular septum – Transmission of sound through the bone.
- 3.8- The cochlea – Functional anatomy – Transmission of sound waves in cochlea – functions of organ of corti – Determination of sound frequency and loudness.
- 3.9- General auditory mechanism: The auditory pathway – Cerebral cortex in hearing – Pitch frequency and amplitude of sound – Hearing threshold.
- 3.10- Abnormalities of hearing: Types of deafness and their tests – Audiometry – Hearing aids.
- 3.11- The sense of taste and smell: Primary sensations of taste – The taste bud and its function – transmission of taste, signals into CNS.
- 3.12- The olfactory membrane – Stimulation of olfactory cells – Transmission of smell signals into CNS – Special attributes of taste and smell.

University of Tripoli

Faculty of Medicine
Department of Physiology

PRACTICAL HUMAN PHYSIOLOGY SYLLABUS

Each student takes 2 hour/week a practical class. The practical classes include the following experiments:

Blood:

- 1- Determination of the bleeding time
- 2- Determination of the coagulation time
- 3- Determination of the packed cell volume (PCV)
- 4- Determination of the hemoglobin content
- 5- Determination of the erythrocyte sedimentation rate (ESR)
- 6- Determination of the blood groups
- 7- Calculation of the blood indices

Cardiovascular system:

1- Heart:

- a) ECG
- b) Determination of the cardiac vector
- c) Calculation of the heart rate

2- Circulation:

- a) Measurement of the systolic and diastolic blood pressure
- b) Calculation of the pulse pressure and mean arterial blood pressure

Respiratory system:

- 1- Static lung volumes and capacities
- 2- Timed vital capacity (FEV₁)
- 3- Peak expiratory flow rate (PEFR)

Special Senses:

- 1- Determination of the visual acuity
- 2- Performance of the hearing tests

Central Nervous System:

1- Sensory examination:

- a) Superficial sensations; Pain, Touch, Temperature
- b) Deep Sensations: Pressure, Tension, Vibration, Position, Movement

2- Motor Examination:

- a) Examination of muscle power
- b) Examination of muscle state
- c) Examination of muscle tone
- d) Examination of muscle reflexes
 - 1- Superficial reflexes: planter reflex; abdominal reflexes
 - 2- Deep reflexes: ankle jerk; knee jerk; biceps jerk; supinator jerk
- e) Examination of clonus
- f) Examination of coordination

