APPENDIX - I

SCHEME AND SYLLABUS OF EXAMINATION FOR THE PURPOSE OF FILLING UP THE POST OF *JUNIOR SPECIALIST* IN THE SIKKIM STATE HEALTH SERVICE:-

1. The examination will consist of 2 papers:-

PAPERS	SUBJECT	FULL MARKS	TIME ALLOWED
PAPER-I	General English & General Knowledge	100 MCQ/Conventional	2.00 hours
PAPER-II	Compulsory Subjects in their respective Specialist discipline	300 MCQ & Conventional	3.30 hours
VIVA-VOICE/Personality Test – 50 marks			

PAPER-I: GENERAL ENGLISH

The question will be designed to test the candidate's understanding and command of the English language. *Mode of Examination pattern shall be objective MCQ, Conventional/MCQ for both Paper-I, General English-General Knowledge and Paper-II (Compulsory Subjects in their respective Specialist discipline).*

English: Candidate will be required to answer questions designed to test their understanding of English and workman like use of words. The Patterns of questions would be broadly as follows:

(i) Comprehension & Grammar.

(ii) Letter Writing/Report Writing/ Project Writing.

General Knowledge: Knowledge of current events of local, National and International importance and of such matter of everyday observation and experience in their scientific aspects as may be expected of any educated person who has not made a special study of any scientific subject.

PAPER-II

The questions will be conventional & MCQ type and will cover areas of knowledge of the following subject and topics:-

ANAESTHESIA : -

- Definition of Anesthesia.
- Different types of Anesthesia.
- Stages of Anesthesia.
- Techniques.
- General Anesthesia.
- TIVA: Total Intravenous Anesthesia.
- Equipment.
- Monitoring.
- Sedation.
- Anesthesia at remote location
  - ✓ MRI
  - ✓ ECT
  - ✓ CT Scan etc.
- Regional Anesthesia and its types.
- Nerve Block.
- Spinal, epidural and caudal anesthesia.
- Acute pain management.
- Pain Scoring Scale.
- Risks & complications.
- Recovery.
- Inhalation Anesthesia.
  - ✓ Injection-dose, uses & complications.
  - ✓ Uses of Defibrillator – CPR: BLC, ALS
  - ✓ Ventilator: SIMU PC, SIMU UC, AC/PC, CPAP / BIPAP/ NPV, Wearing/ SBT.
  - ✓ Placement of Central Venous Lines
  - ✓ ICU and Critical Care: Monitoring, Ventilator
  - ✓ Uses. Invasive, non-invasive, nutritional support, DVT prophylaxes.
  - ✓ Pair management: for end stage diseases. Blocks for chronic pain. Post operation pain.

DERMATOLOGY

The Structure, Functions and development of human skin:

- Ultra Structural aspects of epidermis, epidermal appendages, dermo-epidermal
- Junction, dermis, and sub-cutis. Immunology, molecular biology and genetics in relation to the skin
- Epidermal cell kinetics and keratinization
- Lipids of epidermis and secbaceous glands
- Percutaneous absorption
- Skin as an organ of protection, barrier function and thermoregulation
- Biology of eccrine and apocrine sweat glands Biology of melanocytes and melanin
- Formation Biology of melanocytes and melanin formation
- Biology of hair follicles, sebaceous glands and nail
- Epidermal proteins
- Dermal Connective tissue: collagen, elastin, reticulin, basement memberane an
- groundsunstance. Metabolism of carbohydrates, proteins, fats and steroids by the skin
- Cutaneous Vasculature and vascular reactions
- Mechanisj of Cutaneous would healing
- Cellular and molecular biology of cutaneous inflammation and arachidonic and
- metabolism Role Extracellular matrix metallaproteinases in connective tissue remodeling
- Innate immunity skin
- Immunologic aspects of epidermis /Skin-An immunologic barrier
- HLA system
- Immunogloblins
- Cytokines and chemokines
- Lymphocytes, neutrophils, eosinophils, basophils and mast cells
- Complement System
- Hypersensitivity and allergy/ DNA repair
- Cutaneous carcinogenesis (chemical, viral & radiation) Photo immunology
- Basics of cutaneous bacteriology, mycology, virology, parasitology and host
- resistance common laboratory procedures, stains and culture media etc, related to the cutaneous diagnosis.
- Basic pathologic patterns and reactions of skin
- Common laboratory stains and procedures used in the histopathologic diagnosis of Skin diseases and special techniques such as immunofluorescence, immunoperoxidase and other related techniques.
- Topical and systemic therapy pertaining to Dermatology. Venereology and leprosy

Exanthemeta

Blood Dyscrasias

Diseases of Blood Vessels

Diseases of Reticulo-Endothelia System

Kala Azar and Topical fever with rashes

Yaws

Pigmentory disorders

Sarcoidosis

Tuberculosis

Collagen Disorders (Connective Tissue Disorders)

Genetic disorders of medicine with cutaneous lesions and other related systemic diseases

SKIN DISEASES

Introductory:

Skin diseases in relation to Society

Classification of skin diseases

General Symptomatology

General Etiology

General Pathology

General Diagnosis

General Prognosis

General Therapeutics

Anatomy and Histology of the skin

Growth and replacement of the skin

Differences in the character of the skin in different regions

Skin Pigmentation

Cutaneous glands

Hair and Nail Growth

Blood Supply of the skin

Lymphatics of the skin

Structure of the skin

Chemistry, Physiology and Functional Pathology of the skin, Bio chemistry of Components of the

Skin Physiology:

Proteins	Permeability
Fats	Epidermal Section
Carbohydrates	Respiration
Electrolytes	Meaning Pigmentation
Water	Secretion
Enzymes	Perspiration
Vitamins	Heat regulation
	Protection
	Topography of the skin
	Nutrition of the skin

Hormones Structural and Functional Pathology

Inflammation of the skin

Vascular response

Lymphatic reactions

Regenerations

Pathology, Bacteriology, Parasitology, Mycology etc

Pathological changes of the epidermi

Pathological changes of the corineum

Cells of the corneum

Pathological changes of dermal appendages

Lesions of the skin associated with bacterial infection

Identification of pathogenic bacteria

Experimental transmission of skin diseases

Skin diseases in animals communicable to man

Host-Parasite relationship

Influence of bacteria upon healing

Autogenous disinfection of the sikn

Parasitology in relation to dermatology

Phylum Protozoa

Phylum nemethelminthes

Phylum Arthoproda

Mycology in relation to Dermatology

Dermatophytes

Parasitism of Dermatophytes

Cultivation of the fungus

Moniliasis

Systemic Mycosis

Allergy and dermal hypersensitivity of dermatophytes

Diseases of the skin, its appendages, muco – cutaneous surfaces and Mucousmembrance:

Acone and SebrrhoeicDermatosis

Pruritus (Sympotematic and essential, Psychogenic implication)

ExzematousDermatosis

Urticaria, Toxic erythemes and Drug Eruptions

Collaen-diseases of the skin

Vesiculo-Bullous disorders

Occupational dermatosis

Maculo-Papulo-Squamous diseases

Pyodermas

Fungus infections

Tuberculosis of the skin and allied disorders

Syphills

Virus and other infections including venereal diseases other thensyphills

Diseases due to animal parasites

HyperpigmentationsDepigmentations and Atrophy

Congentia (Nevold) anomalies

Disorders of the mucous membrane

Diseases of the nails, Hairs and other organs relating to the skin

Diseases due to physical agents

Benign tumors of the skin

Metabolic disorders

Premalignant and malignant tumors

Tropical Dermatology including Deficiency Dermatomes:-

Yaws Dermatomes due to Vitamin

Leprosy and national deficiency

Oriental sore and excesses

Syllabus for Gynaecology and Obstetrics:-

Gynaecology

- Pap Smear
- Wet smear examination
- Endometrial Biopsy
- Endometrial Aspiration
- Dilatation and Curettage /Frational Curettege /polypectomy
- Cervical Biopsy
- Cryo /Eletrocautery of Cervix
- Hystero Salpingography & Hysteroscopy
- Diagnostic Laparoscopy & Hysteroscopy
- Opening & closing of abdomen
- Operations for utero vaginal prolapse
- Operations for Ovarian tumors
- Vaginal hysterectomy
- Abdominal Hysterectomy
- Myomectomy
- Colposcopy
- Loop Electro Surgical Excision Procedure
- Tuboplasties
- Paracentesis
- Culdocentesis
- Endoscopic surgery(Operative Laparoscopy & Hysteroscopy)
- Vaginoplasty
- Intrauterine insemination
- Basic ultrasound /TVS
- Hydrotubation
- Vulval Biopsy
- Incision &drainage

Family Planning

- Intra Uterine Contraception Device insertion/removal
- Female sterilization
- Post Partum & Interval
- Open & Laparoscopic
- MTP
- Manual Removal of Placenta
- Breech vaginal delivery
- External Cephalic Version
- Delivery of twins
- Management of shock management of postpartum hemorrhage
- Cervical Cerclage
- Amnio infusion
- Instillation of extra amniotic & intra amniotic drugs
- Non stress Test
- Suction Evacuation

- Dilatation & Evacuation
- Repair of complete perineal tear
- Repair of cervical tear
- Caesarean hysterectomy
- Internal illac ligation
- Uterine & Ovarian Artery ligation
- Destructive operations
- Reposition of inversion uterus
- Amnio centesis

Gynaecology

- Pap Smear
- Wet smear examination
- Endometrial Biopsy
- Endometrial Aspiration
- Dilatation and Curettage/fractional curettage/Polypectomy
- Cervical Biopsy
- Cryo/Electrocautery of Cervix
- Hystero Salpingography
- Diagonistic Laparoscopy & Hysteroscopy
- Opening & closing of abdomen
- Operations for utero vaginal prolapsed
- Operations for Ovarian tumours
- Operations for Ectopic pregnancy
- Vaginal hysterectomy
- Abdominal Hysterectomy
- Myomectomy
- Colposcopy
- Loop Electro Surgical Excision Procedure
- Tuboplasties
- Paracentesis
- Culdocentesis
- Endoscopic surgery (Operative laparoscopy & Hysteroscopy)
- Vaginoplasty
- Intrauterine insemination
- Basic ultrasound/TVS
- Hydrotubation
- Vulval Biopsy
- Incision and drainage

Family planning

- Intra Uterine Contraception Device Insertion/Removal
- Female Sterilization
- Post Partum/ Interval
- Open & laparoscopic
- MTP

PAEDIATRICS

Courses contents:

Guidelines

During the training period, effort must be made that adequate time is spent in discussing child health problems of public health importance in the country or particular region.

Basic Sciences

- Principles of inheritance, chromosomal disorders, single gene disorders, multifactorial/ polygenic disorders, genetic diagnosis and prenatal diagnosis, pedigree drawing.
- Embryogenesis of different organ systems especially heart, genitourinary system gastro-intestinal tract, Applied anatomy and functions of different organ system
- Physiology of micturition and defecation: placental physiology; fetal and neonatal circulation; regulation of temperature, blood pressure, acid base balance, fluid electrolyte balance and calcium metabolism
- Vitamins and their functions
- Hematopoiesis, hermostasis, bilirubin metabolism
- Growth and development at different ages, growth charts; puberty and its regulation
- Nutrition: requirements and sources of various nutrients
- Pharmacokinetics of common drugs, microbial agents and their epidemiology
- Basic immunology, biostatistics, clinical epidemiology, ethical and medio-legal issues
- Teaching methodology and managerial skills.

Understanding the definition, epidemiology, actipathogenesis, presentation, complications, differential diagnosis and treatment of the following,but not limited to:

Growth and development

- Principles of growth and development
- Normal growth and development
- Failure to thrive and short stature
- Development delay
- Hearing and Speech delay/ disorder
- Normal growth and development,
- Sexual maturation and its disturbance's
- Autism (as mentioned in objectives 24)

Neonatology

Management of newborn to mother (HCP B positive, HIV positive, COVID positive)

- Perinatal care
- Care in the labor room and rescuscitation
- prematurity
- common transient phenomena
- infections
- Jaundic
- neurologic disorders
- renal disorders
- thermoregulation and its disorders
- low birth weight
- newborn feeding
- respiratory distress
- apnea
- anemia and bleeding disorder
- gastrointestinal disorders
- malformations
- understanding of perianal medicine
- ROP
- Neonatal Seizure and its management

Nutrition

- maternal nutritional disorders: impact on fetal outcome
- infant feeding including complementary feeding
- protein energy malnutrition
- adolescent nutrition
- Nutritional management of systemic illness (GI, hepatic, renal illness)
- nutrition for the low birth weight
- breast feeding
- vitamin and mineral deficiencies
- obesity
- parenteral and enteral nutrition

Cardiovascular

- congenital heart diseases (cyanotic and acyanotica)
- Infective endocarditis
- diseases of myocardium (cardiomyopathy, myocarditis)
- hyperlipidemia in children
- rheumatic fever rheumatic heart disease
- arrhythmia
- diseases of pericardium
- system hypertension

Respiratory

- congenital and acquired disorders of nose
- infections of upper respiratory tract
- tonsils and adenoids
- obstructive sleep apnea
- congenital anomalies of lower respirator tact
- acute upper airway obstruction
- foreign body in larynx trachea and bronchus
- trauma to larynx
- subglottic stenosis (acute, chronic)
- neoplasm of larynx and trachea
- bronchial asthma
- bronchiolitis
- acute pneumonia, bronchiolitis
- aspiration pneumonia, GER
- recurrent, interstitial pneumonia
- supportive lung disease
- atelectasis
- lung cysts, mediastina mass
- TB/ MDRTB

Gastrointestinal and liver disease

- disease of oral cavity, esophagus
- disorders of deglutition and choledoclucist
- peptic ulcer disease
- congenital pyloric stenosis
- intestinal obstruction disorders
- acute and chronic pancreatic
- malabsorption syndrome
- acute and chronic diarrhea
- irritable bowel syndrome
- inflammatory bowel disease
- Hirschsprung disease
- anorectal malformations
- hepatitis
- hepatic failure
- chronic liver disease
- Budd-Chiaris syndrome
- metabolic diseases of liver
- cirrhosis and portal hypertension

Nephrologic and Urologic disorders

- acute and chronic glomerulonephritis
- Nephritic Syndrome
- xanthema syndrome
- hemolytic uremic syndrome
- urinary tract infection
- VUR and renal scarring
- involvement in systemic diseases
- renal tubular disorders dysfunction
- neurogenic bladder, voiding
- congenital and hereditary renal disorders
- renal and bladder stones
- posterior urethral valves
- hydronephrosis

- underscended testis, hernia, hydrocele
- wilms tumor

Neurological disorders

- seizure and non-seizure paroxysmal events
- epilepsy, epileptic syndromes
- meaningitis, encephalitis
- brain abscess
- febrile encephalopathies
- GuillainBarre syndrome
- neurocysticercosis and other neuroinfestation
- HIV encephalopathy
- SSPE
- cerebral palsy
- neurometabolic disorders
- neurodegenerative disorders
- neuromuscular disorders
- mental retardation
- learning disabilities
- muscular dystrophies
- acute flaccid paralysis and AFP surveillance
- malformations
- movement disorders
- tumor

Hematology and Oncology

- deficiency anemias
- hemolytic anemias
- aplastic anemia
- panctopenia
- thrombocytopenia
- disorders of hemostasis
- blood component therapy
- transfusion related infections
- blood marrow transplant/stem cell transplant
- acute and chronic leukemia
- Hemoglobin pathics
- myelodysplastic syndrome
- lymphoma
- neuroblastoma
- hypercoagulables states

Endocrinology

- hypopituitarism/hyperpituitarism
- diabetes insipidus
- pubertal disorders
- hypo- and hyper-thyroidism
- adrenal insufficiency
- Cushing's syndrome
- adrenogenital syndromes
- diabetes mellitus
- hypoglycemia
- short stature
- gonadal dysfunction and intersexuality
- obesity
- Inborn cause of metabolism (IEM)

Infections

- bacteria (including tuberculosis)
- fungal
- rickettsia
- protozoa and parasitic
- control of epidemics and infection prevention
- viral (including HIV/ SARS – CO 2)
- parasitic
- mycoplasma
- nosocomial infestions
- safe disposal of infective material

Emergency and Critical Care

- emergency care of shock
- respiratory failure
- satusepilepticus
- fluid an electrolyte disturbances
- poisoning
- scorpion and snake bites
- cardio-respiratory arrest
- acute renal failure
- acute sever asthma
- acid-base disturbances
- accidents
-

Immunology and Rheumatalogy

- arthritis (acute and chronic)
- immunodeficiency syndromes
- Kawasaki Diseases
- vasculities
- systemic lupus erythematosus
- MIS in COVID-19

ENT

- acute and chronic otitis media
- post-diphtheritic palatal palsy
- allergic rhinitis/sinusitis
- hearing loss
- acute chronic tonsillitis/adenoids
- foreign body

SKIN DISEASES

- exanthematous illnesses
- pigment disorders
- infections
- atopic, seborrheicdermalitis
- alopecia
- vascular lesions
- vesicobullous disorders
- steven-Johson syndrome
- drug rash
- icthyosis

EYE PROBLEMS

- refractionand accommodation
- cataract
- strabismus
- disorder of retina, including tumors
- partial/total loss of vision
- night blindness
- conjunctiva and corneal disorders
- Amblyopia

BEHAVIORAL AND DEVELOPMENTAL DISORDERS

- rumination, pica
- sleep disorders
- breath holding spells
- mood disorders
- attention deficit hyperactivity disorders
- ASD (Autism Sputum Disorder)
- Dyslexia
- enuresis, encopresis
- habit disorders
- anxiety disorders
- temper tantrums
- autism (as mentioned in objective 24)

SOCIAL/COMMUNITY PAEDIATRICS

- national health programs related to child health
- vaccines: constituents, efficacy, storage contraindications and adverse reactions AEFI
- rational and methodology of pulse polio immunization
- child labor, abuse, neglect
- disability and rehabilitation
- national policy of child health and population
- principles of prevention, control of infections (food, water, soil, vector borne)
- investigation of an epidemic
- IMNCI/ FIMNCI
-
-
- adoption
- right of the child
- juvenile delinquency
-

ORTHOPAEDICS

- major congenital orthopedic deformities or its management
- common bone tumors
- bone and joint infections

APPROACH TO CLINICAL PROBLEMS

GROWTH AND DEVELOPMENT

- precocious and delayed puberty
- impaired learning
- development delay

NEONATOLOGY

- low birth weight new born
- sick newborn

NUTRITION

- lactation management and complementary feeding
- protein energy malnutrition (underweight, wasting, stunting and micronutrient deficiencies
- failure to thrive

CARDIOVASCULAR

- murmur
- congestive heart failure
- arrhymia
- cyanosis
- systemic hypertension
- shock

GIT AND LIVER

- diarrhea
- abdominal pain and distension
- vomiting
- gastrointestinal bleeding
- hepatosplenomegaly
- persistent and chronic diarrhea
- ascites
- constipation
- jaundice
- hepatic failure and encephalopathy

RESPIRATORY

- cough/chronic cough
- wheezy child
- hemoptysis
- respiratory distress

INFECTION

- acute onset pyrexia
- prolonged pyrexia with and without localizing signs
- recurrent infections
- noscominal infections
- fever with xanthema

RENAL

- hymaturia/ dysuria
- voiding dysfunctions
- hypertension
- bladded/bowel incontinence
- renal failure (acute and chronic)
-

HEMATOLOGY AND ONCOLOGY

- anemia
- bleeding

NEUTROLOGY

- limping child
- paraplegia, quadriplegia
- macrocephaly and microcephaly
- acute flaccid paralysis
- convulsions
- cerebral palsy
- floppy infant
- headache

ENDOCRINE

- thyroid swelling
- obesity
- ambiguous genitalia
- short stature

MISCELLANEOUS

- skin rash
- epistaxis
- arthralgia, arthritis
- lymphadenopathy
- proptosis
-

RADIOLOGY/ RADIODIAGNOSIS

Preamble :

Our purpose is to standardize Radio diagnosis teaching at Post Graduate level so that it will benefit in Achieving uniformity in undergraduate teaching as well and resultantly creating competent Radiologist with appropriate expertise.

Programme Objectives :

The objectives is to train a student to become a skilled and competent Radiologist to conduct and interpret various diagnostic / interventional imaging studies (both conventional and advanced imaging), to organize and conduct research and teaching activities and be well versed with medical ethics and legal aspects of imaging / intervention.

Specific learning Objectives :

A Resident on complaining his / her MD (Radio Diagnosis)

1. Acquir good basic knowledge in the various sub – specialities of Radiology such as Neuroradiology, GI radiology, Uroradiology, Vascular Radiology, Musculkeletal, Interventional Radiology, Emergency Radiology, Paediatric Radiology and Imaging of breast.
2. Independently conduct and interpret all routine and special radiolocia and imaging investigations.
3. Provide radiological services in acute emergency and trauma including its medicolegal aspects.
4. Elicit indications, diagnostic features and limitations of applications of ultrasound, CT and MRI and should be able to describe proper cost effective algorithm of various imaging techniques in a given problem setting.

Part – I Medical Radiation Physics as applied to Radio – Diagnosis : -

1. **Basic concepts :**
   Radiation and atom – Electromagnetic radiation – Structure of atom – Atomicnucleus – Radioactivity – Nuclear fission and fusion.

2. **Production of X – Rays:**
   X- ray production – X- ray tubes – Tube rating charts – Interaction of electron with target Intensity and quality of x- ray beams.

3. **Interaction of radiation with matter :**
   Particle interaction – photon interaction – coherent scattering photoelectric effect – Compton scattering – pair production – their relative importance.

   Attenuation – Attenuation coefficient – Factors affecting attenuation – Applications to Diagnostic Radiology.
4. **Radiography :**

Film screen radiography – Cassettes – Intensifying Screens – Radiography film – Digital Radiography – Scattered radiation – Methods to reduce scattered radiation – Grid characteristics - Grid artifacts – Moving grids – Air gaps – Filters – Cones and Cylinders – Collimators Radiographics image quality – contrast – Noise – Spatial resolution.

5. **Fluroscopy :**
   General principle – Real time imaging – postioning – Fluroscopic equipment optical coupling – photo cameras – spotfilm – cineradiography.

6. **Specific radiography:**
   Stereo radiography – Conventional tomography – Digital subtraction angiography – Mammography – Recent developments in Radiography.
   Computed Tomography – Basic principles – Historical developments – CT generators – image acquisition – Reconstruction techniques – Artfacts – Display.

7. **Modern Imaging systems :**
   Ultrasound – Basic principles – production of ultrasound – Interaction of Ultrasound with matter – images acquisition – image quality – Artfacts – Dopller ultrasound – Biological safety
   Magnetic Reasonance Imaging – Basic principles – Imageacquisition – Reconstruction techniques – image characteristics – Artfacts – MRI instrumentation – Biological safety.

8. **Nuclear Medicine :**
   Radioactivity – Radionuclide production – Radiopharmaceuticals – Radiation detectors –

   Thyriod probe – Well counter –Dose calibrator – Counting Statistics.

   Nuclear imaging – Augar scintillation camera – computers in nuclear imaging. Nuclear tomography – single photon emission computer tomography positron emission tomography – Recent advances.

9. **Radiation Biology :**
   Biological effects of Radiation – Interaction of radiation with tissue – Cellular Radio – Biology – Response of organs to radiation – Acute radiation syndrome – Radiation induced.
   Carcinogenesis – Hereditary effects of radiation – Radiation effect in utero – recent concepts.

10. Radiation protection:

Natural radiation – Occupational exposures – Personnel dosimetry – Film badge – TLD pocket dosimeter – Area monitoring survey meters – Contraol – Time, distance shielding – Protective barrier specification – Workload, use factors, Occupancy factors – Planning diagnostic and Nuclear Madicaine departments.

Guidelines for safe work practice – Regulatory agencies – Atomic energy regulatory agencies – Atomic energy regulatory board – Radiation protection rules in India – ICRP Recommendations – Dose equivalent limits – Recent concepts.

Part II

Radiology – Course contents :

1. Musculo – Skeletal syatem
2. Respiratory system
3. Cardiovascular system
4. Gastrointestinal system
5. Urogenital tract
6. CNS including Spine
7. Imaging of Obstetrics & Gynecology
8. ENT, EYES, Teeth, Soft tissue, Breast
9. Endocrine System
10. Clinically applied radio – Nuclide imaging
11. Contrast agents

Training in different organs system :

Various Diseases involving the following systems (A student have adequate knowledge of procedures and interpretation of all conventional and advanced techniques and interventions whenever needed)

1. Musculo sketal system – Interpretation of disease of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, metabolic and endocrine neoplastic and miscelleneous conditions.
2. Respiratory system – Diseases of the chest wall, diaphragm, pleura and airways, pulmonary infections, pulmanory vasculature, pulmanory neoplasm, diffuse lung disease, mediastinal disease, chect trauma, post – operative lung and x-ray in intensive care.
3. Cardiovascular system – Diseases and disorders of the cardiovascular system (Congenital and acquired condition) and the role of imaging by conventional radiology, ultrasound, colour Doppler, CT, MRI, Angiography and Isotope studies.
4. Gastro intestinal tract and Hepato – biliary pancreatic system – diseases and disorders of moutn, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery, acute abdomen, abdominal trauma. Disease and disorders of Hepato – billary pancreatic system.

5. Urogenital system – various diseases and disorders of Genito – Urinary system including congenital, inflammatory, traumatic, neoplastic, calculus disease and miscellaneous, degenerative, metabolic conditions.
6. Central Nervous systemincluding imaging (conventional and newer methods) and Interpretation of various diseases and disorders of the head, neck and spine covering congenital, infective, Vascular, Traumatic, neoplastic, degenerative, Metabolic and miscellaneous condition.
7. Radiology of Emergency Medicine.
8. Radiology of Obstetric and Gynecology
9. Evaluation of Breast by imaging and interventions.
10. ENT, Eyes and teeth
11. Endocrine glands.
12. Clinical applied radionuclide Imaging
13. Interventional Radiology related to different systems of body.
14. PET and SPECT Imaging Techniques
15. Status of Radiological Developments in Sikkim and current scenario

TRANSFUSION MEDICINE AND IMMUNO HAEMATOLOGY

Topic I: History of Transfusion Medicine (0.5%)

1.0: Identify and relate the important features of the history of transfusion medicine

1.1: Outline the scientific benchmarks in the evolution of transfusion medicine

1.2: Explain how specific innovations affected transfusion medicine practice

1.3: Describe recent trends in the practice of transfusion medicine

Topic II: Scientific Basis of Transfusion (14%)

2.0: Describe the biochemical properties and characteristics of the major surface antigens of the formed elements of the blood

2.1: List of clinically significant antigen systems and associated phenotypes

2.2: Compare the expresson of these antigen systems on red cells and other cells in blood

2.3: Describe the biochemical properties of the ABO antigens

2.4: Describe the biochemical properties of the Rh an MNS blood group systems

3.0: Genetics of the major surface antigens of the formed elements of the blood

3.1.: Describe the principles of antigen inheritance

3.2: Identify the genotypes that produce the common phenotypes in the ABO and Rh system

3.3: Order and phenotypes of the ABO and Rh blood groups by frequency of occurrence in the major ethnic groups.

4.0: The role of the HLA (Major histocompatibility complex (MHC) system in transfusion, transplantation and associated diseases

4.1: Describe the nomenclature used for the HLA (MHC) system

4.2: Describe the inheritance of HLA antigens

4.3: Compare the biochemical properties of Class I and II antigens

4.4: Describe the distribution of the HLA antigens on blood cells an other tissues

4.5: Explain the role of MHC in cellular immunology

4.6: Describe the microlymphocytotoxicity assay, comparing its use for HLA typing and crossmatching.

4.7: Describe the principles of the mixed lymphocyte culture test

4.8: Identify clinical situations in which the mixed lymphocyte test is used for donor selection

4.9: Identify significant HLA disease associations

5.0: Analyze the clinical and pathological consequence of antibodies to red cells

5.1: Distinguish the naturally occurring antibodies from those requiring prior immunization

5.2: List the blood group system in which antibodies are naturally occurring and the most important ones in which unexpected (irregular) antibodies occur

5.3: Compare transfusion and pregnancy as immunizing events

5.4: Describe the techniques for detection of antibodies / complements on red cell membrance

5.5: Interpret the results of tests for detection of red cell antibodies

5.6: Outline the mechanisms of red cell destruction

7.7: Describe the importance of complement activation and antibody medicated red cell destruction.

6.0: Relate the kinetics and function of the cellular elements of blood to normal and disease states

6.1: Describe the process of cell production of red cells, neutorphils, lymphocytes and platelets

6.2: State the lifespan of blood cells in normal and disease state

6.3: Describe neutrophil functions in defense against bacterial infection

6.4: Describe the role of the platelet in hemostasis

6.5: Describe the function of lymphocyte subpopulations in normal and disease states

6.6 : outline the pathophysiology and clinical features of disorders caused by abnormalities of cell function or number.

7.0: Relate the structure and function of haemoglobin to normal and disease states

7.1: Describe the role of haemoglobin in oxygen transport

7.2: Draw the haemoglobin molecule indicating the oxygen-binding sites

7.3: Describe how abnormalities in haemoglobin may effect the ability to transport oxygen

7.4: Outline the Steps I haemoglobin degradation

7.5: State the amount of iron normally present in the blood and narrow storage compartment.

8.0: Apply the principles of basic mechanism of blood coagulation to the diagnosis andtreatment of coagulation disorder.

8.1: Describe the interaction of soluble coagulation actors with platelets

8.2: List the steps in the fibrinolytic pathway

8.3: Identify the abnormalities of coaulation in common hemostatic disorders

8.4: Describe the role of fibrinolysis in normal and abnormal hemostasis

8.5: Describe the interactions among the coagulation, complement, kallikerin, and immunologic systems.

8.6: Describe the principles of the common screening tests for abnormalities in haemostasis

8.7: Interpret the results of coagulation tests in specific clinical situations.

8.8: Integrate clinical information with result of coagulations tests to establish a diagnosis and treatment plan.

9.0: Relate the principles of the hemodynamics of circulation to the diagnosis and treatment of hypervolemia and hypovolemia

9.1: State the normal values for blood volume

9.2: Identify the physiologic mechanisms for control of blood volume

9.3: Describe the compensatory mechanism for abnormalities in blood volume

9.4: Describe the symptoms and signs associated with abnormalities in blood volume.

9.5: Integrate the clinical and laboratory date to establish the diagnosis of hypervolemia and hypovolemia

Topic III: Management of blood donation and preparation of blood components (6%)

10.0: Determine the acceptability of individuals for blood donation through appropriate consultations with donor personnel.

10.1: Identify the donor's risks in blood donation.

10.2: Identify potential risks to the recipient.

11.0: Construct a plant to care for blood donors

11.1: Delineate the complications of blood donation.

11.2: Describe the presentation and management of complications of blood donation

12.0: Analyze significant issues in donor recruitment

12.1: Explain the concepts of community responsibility and individual responsibility

12.2: Compare paid and volunteer blood donation systems

12.3: Define directed donation and autologous donations

12.4: Describe the impact of these types of donation on the safety and adequacy of the blood supply

13.0: Outline the procedures for donor blood processing

13.1: Name the tests required for donor blood processing

13.2: Describe the potential patient complications if errors occur in donor blood processing

13.3: Evaluate the effectiveness of pretransfusion hepatitis, syphilis, and HIV testing

14.0: Describe the preparation and composition of blood components

14.1: Outline the basic steps in component production

14.2: List the functional composition of each component

15.0: Describe the preparation nd production of blood derivatives

15.1: Distinguish between a blood component and a blood derivative

15.2: List the blood derivatives that are prepared commercially,

15.3: Describe the composition of each blood derivative

16.0: Describe the changes in blood component

16.1: State the wxpiration period for each component

16.2: Describe the changes in each component with storage

16.3: Identify adverse effects of transfusion that may result from storage-induced change in blood components

16.4: Compare the potential risks and benefits of transfusing blood products stored for varying lengths of time.

Topic: IV Pretransfusion testing (4%)

17.0: Explain the basic procedures used for blood compatibility testing:

17.1: Define the basic terms associated with tests for blood compatibility

17.2: Explain the principles of red cell compatibility

17.3: Describe the methods for determining compatibility of donor blood with recipient.

17.4: Explain what 'Compatibility crossmatch' means

17.5: Distinguish testing procedures for red cell and red cell free components

17.6: Describe and explain the criteria for selection of an appropriate donor unit

17.7: Distinguish between emergency and elective selection of blood

18.0: Apply immunologic principles of blood cell compatibility to clinical situations

18.1: Identify the clinical situations associated with formation of antibodies to blood cell antigens.

18.3: Correlated the results of laboratory tests within vivo reactions.

Type V: Transfusion of blood components (47%)

General aspects of transfusion

19.0: Describe the major indications for the following blood components and derivatives

19.1: Whole Blood

19.2: Red cells (including additive solutions)

19.3: White cell poor red cell products (such as washed red cells, previously frozen deglycerolized red cells, and filtered red cells).

19.4: Platelets (concentrates or apheresis product)

19.5: Granulocytes (concentrates or apheresis product)

19.6: Single-donor plasma (eg. Fresh-frozen plasma or plasma frozen after 24 hours)

19.7: Cryoprecipitate

19.8: Coagulation factor concentrates (eg. Factor VIII, prothrombincomplex,or anti inhibitor coagulant complex)

19.9: Colloid solutions (albumin and plasma protein fraction)

19.11 Autologous blood (pre surgical deposit or intraoperativeadn traumatic salvage)

19.12: Vaccines (eg. Hepatitis B vaccine)

20.0: Construct an appropriate plan for administering blood products (19, 1-19, 12) that considers dosage, infusion equipment, and rate of administration. B. Cardiopulmonary bypass

21.0: diagnose and develop a plan for treatment of symptomatic coagulating abnormalities develop in following cardiopulmonary bypass (CPB)

21.1: List the laboratory test that should be ordered to evaluate a patient bleeding after CPB

21.2: List the laboratory tests that should be ordered to evaluate a patient bleeding after CPB

21.3: Synthesize the clinical and laboratory information to establish the cause of bleeding

21.4: Select the proper blood component (or other medication) to treat the bleeding diathesis.

C. Emergency medicine (massive transfusion haemorrhagicshocik, burns)

22.0: Construct the appropriate orders for compatibility testing in massive transfusin,

22.1: Define massive transfusion

22.2: Identify the correct use of 'type-specific' blood

22.3: Identify the correct use of O-negative or O-positive blood in patients with unknown ABO type.

23.0: Explain the rationale for the use of various components in massive transfusion

23.1: Describe the coagulation and metabolic abnormalities

23.2: Order coagulation and metabolic abnormalities in the terms of clinical importance

23.3: Define the indications for platelet transfusion

23.4: Compare the indications for whole-blood versus packed cells

23.5: Define the indications for fresh-frozen plasma

23.6: Evaluate the risks and benefits of blood savage techniques during massive transfusion.

24.0: Describe fluid losses associated with burns.

24.1: Describe operative and non-operative mechanisms of fluid and protein loss in burn patients.

D. General surgical support

25.0: Construct appropriate preoperative orders for blood.

25.1: Recall the factor used to evaluate haemostatic safety preoperatively

25.2: Identify appropriate orders for blood and blood components for elective surgical procedure, including the use of type and screen

25.3: Describe the use of the maximum surgical blood order schedule in preparing preoperative blood orders.

26.0: Evalute preoperative transfusion needs

26.1: Describe the methods of predicting estimated blood loss

26.2: Describe the treatment for hypovolemia

26.3: Correlate for clinical symptoms and measurements of blood loss to determine if transfusion is needed.

27.0: Recognized the cause of blood wastage

27.1: Define the time limits for nonrefrigerated blood

27.2: Define the desirable cross match: transfusion ratio

E. Haematology and Oncology

28.0: Outline the diagnosis and management of haemotastic defects including thrombocytopenia