Annexure to notification No. 30-P&C(DR-P)of 2022
Dated :- 31-12-2022 (Page. 1-123)

SYLLABUS FOR WRITTEN TEST (OBJECTIVE TYPE) FOR THE POST OF ASSISTANT PROFESSOR MEDICAL EDUCATION DEPARTMENT

1- ANATOMY

Unit–I
GeneralAnatomy
Anatomical Terminology -Anatomical position, Terms of Position & movement.
Skin&Fascia–Differenttypesofskin,Dermatomesinbody,Skinappendages&Skin Incisions. Superficial fascia,Deep fascia& its modifications.
Muscle – Classification of muscles, Differentiation between Tendons & aponeurosis,Shunt &Spurtmuscle.
NervousSystem – Components of Central, Peripheral & Autonomic nervous system,Neurons&Neuroglia,TypicalSpinalnerve&Synapse,Sympathetic&SpinalGangli a.
Bones & Joints – Classification & Ossification of Bones, Various types of cartilage,Classificationof Joints.
Glands–Exocrine&Endocrineglands-classification&function.
Vascular&Lymphaticsystem–
Generalfeaturesofarteries,Veins,lymphatics,portalsystem,arterialanastomoses.Defi neThrombosis,Infarction&Aneurysm.

Unit-II
Osteology–Structure,attachment, relations, ossification, agechanges&bloodsupplyof allbones&cartilages.

Unit-III
Myology–Attachment,action,nervesupply&vascularsupply,relationofimportant muscles of Upper limb, Lower limb,Thorax, Abdomen, Pelvis, Perineumand Head&Neck.

Unit –IV
Arthology–Structure,relation,movements,vascular,nerve supply&appliedanatomyofalljointsof thebody.

Unit –V
Cardio-Vascular– Pericardium, External& Internal features of all the chambers ofHeart,Bloodsupply,NerveSupply,FibrousSkeleton&AnatomicalBasisofIschemicHear tDisease.

Unit-VI
LymphaticSystem-ImmuneSystemandthecelltypesinvolvedindefencemechanisms of the body. Gross features, Cyto architecture, functions, development andhistogenesis ofvariousprimaryand secondarylymphoidorgans.
Biological and clinical significance of the major histocompatibility complex of manincludingitsroleintransplantation,diseasesusceptibility/resistanceandgeneticcon trol oftheimmune response.
Lymphatic Drainage of all parts & organs of the body.Position & Relations ofvarious

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groups oflymph-nodes.Majorlymph vesselsofthe body.

Unit-VII

Neuroanatomy–BrainanditsenvironmentincludingMeninges,CSFandDuralVenous Sinuses. Development of nervous system. Neuron and Neuroglia, SomaticSensorysystem,OlfactoryandOpticpathways,CochleovestibularandGustatory pathways, Motor pathways, Central autonomic pathways, Hypothalamo-hypophysealsystem,Limbicsystem,Basal ganglia,Reticular system,Cross-sectional anatomy oftheBrain,BrainstemandSpinalcord.DetailedstructureofCNSanditsappliedanatomy.BloodSupplyof Brainand SpinalCord.

Unit-VIII

Special Senses– Anatomy of peripheral receptors ofTaste,Smell,Vision,Hearing&Touch andtheircentral connections,pathways,functions &appliedaspect.

Unit- IX

Splanchnology– Gross Anatomy of all visceras& organs including – Respiratory,Digestive,Urogenital,lymphoidorgans,Endocrine &Exocrineglands.

Unit-X

Embryology–

Generalembroyology:Gametogenesis,UterineandOvariancycle,Fertilization,Implantation andPlacenta.Earlyhumanembryonicdevelopment.

Systemicembryology: Developmentoforgansystemsandassociatedcommoncongenital abnormalitieswith teratogenesis. PhysiologicalCorrelationsofcongenitalabnormalities.

Unit-XI

Genetics- Human Chromosomes- Structure, number and classification, methods ofchromosomepreparation, bandingpatterns. Chromosomeabnormalities,AutosomalandSexchromosomalabnormalities&syndromes,MolecularandCytogenetics.

SingleGenePatterninheritance-

AutosomalandSexChromosomalpatternofinheritance,Intermediatepatternandmultiplealleles,Mutations,Non-mendelianinheritance.Mitochondralinheritance,Genomeimprinting,parentaldisomy.

MultifactorialpatternofInheritance-

Teratology,structuregene,MolecularScreening,Cancergenetics,haematological malignancies,Pharmacogenetics.

Reproductiongenetics-MaleandFemaleinfertility,Abortuses,Assistedreproduction, Preimplantation genetics, Prenatal diagnosis, Genetic counselling, ethicsofgenetics,principlesofgenetherapyanditsapplied.

Unit-XII

Microanatomy–CellBiology-Cytoplasm-Cytoplasmicmatrix,Cellmembrane,CellOrganelles,Cytoskeleton,CellInclusions,Cilia and flagella. Nucleus-Nuclearenvelope,nuclearmatrix,DNAandothercomponentsofchromatin,proteinsynthesis,nucleolus,nuclearchangesindicating celldeath. Cell cycle- Mitosis, meiosis, cell

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renewal, cellular differentiation and proliferation.MicroscopicstructureofBody-Types&parts,Studyofhistologicalfeaturesofallthecells,tissues&organsof thebody. Principlesoflight,transmissionandscanning,electron,fluorescent,confocalandvirtual microscopy. Systems/OrgansofBody-Cellularorganization,lightandelectronmicroscopicfeatures,structure-function correlationsandcellularorganization.

Unit-XIII

Applied Anatomy- Application of knowledge of structural, development, neuroanatomy to comprehend deviations from normal.

Clinicalcorrelationsofstructureandfunctionsofhumanbody.Anatomicalbasisandexplanations for clinicalproblems.

Unit-XIV
FunctionalAnatomy–RelationshipofstructureS&functionsinrespecttovariousTissues & Organsof thebody.

Unit-XV
Living Anatomy– Surface marking of all regions of the body. Interpretation of normalradiographs of the body including Barium studies, cholecystography, pyelography,salphingography,normalCTscan,MRI and Ultrasound.

Unit-XVI
Sectional Anatomy – Cross/Sagittal/Coronal Sections of Brain, Head & neck, Thorax,Abdomen, Pelvis & Limbs to understand inter-relation of organs & interpretationwithCT&MRI.

Unit-XVII
RecentAdvances-Recentadvancesinmedicalscienceswhichfacilitatecomprehension of structure function, correlations and applications in Clinical problemsolving. Collection,maintenanceandapplicationofstemcells,cryobankingandprinciplesoforgan donationfromrecentlydeadbodies.

Unit-XVIII
RadioDiagnosis- Identificationof Plain X-rays,specialradiographicproceduresand Arteriography.

Unit-XIX
Embalming–
Basicknowledgeoftypesofembalmingandtypesofembalmingfluids.Embalminginspecialcircumstanceslikeburns,drowningandpostmortembodiesetc.

Unit-XX
ForensicMedicineandAnthroplogy:
Identificationofhumanbonesfromtheirremainsanddeterminationofsex,ageandheight for medicolegal applicationofAnatomy.
Differentanthropologicaltraits,identificationanduseofanthropologicalinstruments.PelvimetryandCephalometry.

- **Recent advances and developments in the discipline.**

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2-PHYSIOLOGY

Unit-I-GeneralPhysiologicalPrinciples:
Principlesofhomeostasis,Positive&NegativeFeedbackMechanisms,StructureofCell,Structure of Cell Membrane, Intercellular communications, Transport across Cell Membrane,Gibbs-Donnan equilibrium, Nernst Equation, Fluid compartments of the body. Measurement ofFluid Volumes, Osmotic Equilibrium between ECF & ICF.Basic principles of Genetics and itsApplied aspects, Genetic code- its expression, and regulation ofgene expression, Cell cycle and itsregulationand Apoptosis.Applied aspects ofGeneral Physiology.

Unit-II-Blood:
Composition and functions of blood, types & functions of Plasma proteins, Immunoglobulins,RBC:formation&functions,BloodIndices:PCV,MCV,MCH,MCHC.AneamiaswithClassification & Description, Polycythemias, Fate of Red Blood Cells, Hemoglobin- synthesisand functions, Chemistry of Bilirubin Formation & Jaundice, Blood Groups: basis of bloodgrouping, & its clinical importance, blood banking and transfusion, Principles of transfusionmedicine,WBC:formation,functionsandLeucopenia&Leukemias,Macrophages,Inflammation-PathoPhysiology,Platelets:formation&functions.Haemophilia,DIC,Thrombocytopenic Purpura, Haemostasis and its applications inclusive of anticoagulants andBleeding Disorders, Mechanism of Coagulation, Coagulation tests. Thymus and Immunity,Innate immunity, Acquired immunity, Allergy, Hypersensitivity and Immunodeficiency, AutoImmuneDisorders.Tissue&OrganTransplant.LymphoidTissues&LymphAbnormalclottingandbleeding(coagulationfactorsandanticoagulants),Fibrinolysis,CongenitalAbnormalities.
Immune Disorders. The physiological basis of the treatment of such conditions and side effectsofdrugs used.Applied aspects of Hematology.

Unit-III-Muscleand NervePhysiology:
Structure, functions andproperties of Neuron and Neuroglia, Classification, functions andpropertiesofNerveFibers,Molecularbasisofrestingmembraneandactionpotential,Transmission of Nerve Impulse, Nerve Injuries, Wallerian Degeneration,Regeneration of Nerve Fibre after Injury,Structure, types and properties of Muscle Fibers,Action potential in different muscle types, Excitation-Contraction coupling, Mechanisms ofmusclecontraction,StructureandtransmissionacrossNeuro-MuscularJunction,Neuro-muscularblockingagents,PathophysiologyofMyastheniagravisandEaton-LambertSyndrome, Muscular changes during exercise.Visceral smooth muscle,Multi unit smoothmuscle,Processofexcitationcontractioncouplinginsmoothmuscle,Characteristics–Plasticity,Latch Phenomenon.Applied aspectsofNerveMuscle Physiology.

Unit-IV-RenalSystem:
Structure and functions of nephron, Structure and functions of Juxta glomerular apparatusinclusive of Renin-Angiotensin-Aldosterone system (RAAS), Physiology of urine formation,Transport maximumandRenal threshold, GFR and factors affectingGFR, Mechanismofconcentration and dilution of urine inclusive of counter current mechanism, Acidification ofUrine,Fluid, Bodyfluidcompartments,Waterbalance:regulationoffluidbalance,electrolyte,Regulation of extracellular sodium and osmolarity, Concept of Renal Clearance,Acid base balanceand its regulation, Innervations of bladder, micturition, cystometrogram, Bladder Dysfunction,Diuretics, Artificial kidney, Dialysis, Radiology & Renal imaging, Renal Failure & RenalFunctionTest, Renal Transplant. Applied aspectsofRenal Physiology.

Unit-V-DigestiveSystem:
GeneralorganizationofGITmuscles,InnervationandNervePlexuses.Functionsandcomposition of Salivary secretion, Gastric secretion, Pancreatic secretion, Intestinal secretionand Bile. Liver – structure and functions, liver function tests. Jaundice – types & laboratoryinvestigations. Gastro-intestinal hormones-source, regulation and functions, Gastro-intestinalmovements, G.I.T. reflexes. Vomiting and Diarrhea, Constipation. Dietry fibres. Digestion andabsorptionofcarbohydrates,proteins,fats,vitamins,mineralsandtraceelements.Pathophysiologyofpepticulceranddiarrhealdisease,Patho–PhysiologyCause&ClinicalFeaturesofAcutePancreatitis.Gallstones,Constipation,Steatorrhoea,MalabsorptionSyndrome.Appliedaspects ofG.I.T.

Unit-VI-Endocrinology:
Types of hormones, mechanism of hormone action, Estimation and assessment of hormones.PhysiologicalactionsandeffectofalteredsecretionsofPituitaryGland,ThyroidGland,Parathyroid Gland, Adrenal Gland, Pancreas, Pineal and Hypothalamus. Disorders of Anterior&PosteriorPituitary,ThyroidDisorders,ThyroidfunctionTests,Anti–Thyroiddrugs.Disorders of Parathyroid Gland, Calcium homeostasis, Bone Physiology, Applied-MetabolicBoneDiseases.DisordersofAdrenoCortical&medullaryhormones.AppliedaspectsofEndocrineSystem.

Unit-VII-ReproductiveSystem:
Sex differentiation & development functions of Testis & Ovary, Spermatogenesis & factorsinfluencingit,Cryptorchidism,ChromosomalAbnormalities.Menstrualcycle-hormonal,uterine and ovarian changes, Menstrual Disorders, Physiological changes during pregnancy,foetoplacentalUnit,PlacentalHormones,parturitionandlactation,Physiologicalbasisforpubertal changes and menopause, Pubertal Disorders, Physiological effect of sex hormones,TestsofPregnancy,FoetalandNeonatalPhysiology,PhysiologyofContraceptionandContraceptivemethods (maleandfemale methods). Applied aspectsof ReproductiveSystem.

Unit-VIII-CardiovascularSystem:
Structure and properties of cardiac muscle, Resting membrane & action potential, Excitation –contraction coupling phenomenon, Process of cardiac muscle contraction, Pacemaker

potential,ConductingsystemofHeart,Mechanicalevents&pressureVolumechangesduringCardiac Cycle, Heart Sounds, Murmures, Valvular lesions. Frank Starling Law, Juglar Venouse PulseRegulationofheartrateandbloodpressureandcardiacoutput,Electrocardiogram-physiologicalbasisandapplications,AbnormalECG,AbnormalECGpatterninmyocardialinfarction, cardiac arrhythmias (briefly), Effect of changes in ECF K+, Ca++ and Na+ Conductiondefects-
define1º,2ºand3ºblock(mention),electricalaxisofheart.HeartblocksandPatho-PhysiologyofHeart-failure.Haemodynamicsofcirculatorysystem,Regionalcirculation-coronary,Splanchnic,cerebral,capillary,foetalandpulmonarycirculation.Physiology of shock, coronary artery disease, hypertension, Cardio-pulmonary resuscitation,Lymphaticcirculation.Cardiovascularresponsestoexercise.Appliedaspect ofCVS.

Unit-IX-RespiratorySystem:
Functionalanatomyofrespiratorysystem,physicalprinciplesofgaseousexchange,Surfactants,Transportofrespiratorygases,Mechanicsofnormalrespiration,PulmonaryVolumes &Capacities,PulmonaryVentilation,Ventilation-
PerfusionRatio,Regulationofrespiration, Lung function test-clinical significance, Principles of artificial respiration, OxygenTherapy,acclimatizationathighaltitudeanddecompressionsickness.Hypoxia,Carbonmonoxidepoisoning,OxygenToxicity,cyanosisandasphyxia.Cardio-respiratorychangesduringexerciseandYoga,PulmonaryAbnormalities-
ChronicPulmonaryEmphysema,Pneumonia,Atelectasis,Asthma,BloodGasAnalysis,ArtificialRespiration,Effectsofacceleratory forceson the body inAviation&SpacePhysiology, ArtificialClimateinthesealed Spacecraft, Weightlessness in Space, Physiological changes at High Altitude, Acute &Chronic Mountain Sickness, Pulmonary Oedema, Artificial ventilation & CardiopulmonaryResuscitation,Hazards ofDeep seadiving. Applied aspectsofRespiratorySystem.

Unit-X-CentralNervousSystem:
Organization of nervous system. Functions, types and properties of synapse, Neurotransmitters,Spinal Cord Anatomy & ItsFunctions, Strech reflexes & Tendon Jerks, Muscle spindle &Golgi Tendon Organ, Physiology of Brain Stem, Sensoryreceptors. Motor and sensory systemand its applied aspects. Neurophysiology of Cortex, Basal Ganglia, Thalamus, Hypothalamus,Cerebellum,LimbicsystemandReticularactivatingsystem.Parkinsonism .Mechanismofmaintenance of tone, posture and equilibrium, Regulation of Posture & Movement, Vestibularapparatus, Higher functions - Memory, Learning inclusive of conditioned reflexes, Speech & itsdisorders,Sectionsofspinalcord,EEGandSleep.EpilepsyAlzhiemer'sdisease,SleepDisorders, Neuro-physiology of Pain. C.S.F. Autonomic nervous system. Autonomic FunctionTest,Drugs Acting on ANS.Applied aspect of CNS.

Unit-XI-SpecialSenses:
Functional anatomy of eye - Physiology of image formation, photo transduction, colour vision,refractive errors, Visual reflexes-pupillary and light reflex, Visual pathways and Visual fielddefects. Phototransduction of Light, Functional anatomy of ear, Functions of External ear,Middle ear & Cochlea, properties of sound, mechanism of hearing and deafness, Hearing Test.Hearing Aids, Role of Inner ear in Balance & Equilibrium.Perception of smell and tastesensation, pathways and its

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applied aspects. Auditory & visual evoked potential. Applied aspectofEar andEyePhysiology.

Unit-XII–Environmental Physiology:
Mechanism of temperature regulation, Adaptation to altered temperature (heat and cold),Mechanismoffever,cold injuriesandheatstroke. PhysiologicalChangesto Adaptationsinvariousenvironments.

Unit-XIII-Physiologyof Sports,Exercise, YogaandMeditation:
Cardio-
respiratoryandmetabolicadjustments,Physiologicaleffectsofyogaandmeditation.

Unit-XIV-Physiology ofAgeing:
Physiological and Psychological changes of ageing, theories of ageing and Prevention ofageing.

UnitXV-HistoryandRecentAdvancesin Physiology:
ContributionofPhysiologistindevelopmentandevolutionofnewertechniquesandprogres sinfield of Physiology.

- **Recent advances and developments in the discipline.**

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3-BIO-CHEMISTRY

UNITI:BIOCHEMISTRYLABORATORY

1. **Measurementofmass-**Basiccalculations andpreparationofsolutions.
2. **Laboratoryessentials–**
   Laboratoryglassware,basicequipments,collectionandpreservationofbiologicalfl uids,bloodcollection-
   methods,separation,precaution,preservation,storageandtransport ofblood sample.
3. **Goodsafelaboratorypractice-**
   Hazardsofdangerouschemicals,infectionhazards,first-aidand emergencytreatment in laboratory.
4. **Instrumentation/techniques -** pH Meter, colorimetry, spectrophotometry,
   electrophoresis,chromatography,ISE,massspectrometry,flowcytometry,chem iluminescence,radioimmunoassay,ELISA,autoanalyser,arterialbloodgasanalys erandclinicalapplicationsof thetechniques.
5. **Biomedical waste management** - Classification of hazardous waste, waste managementprocess.
6. **Totalqualitymanagement-**
   Qualitylaboratoryprocesses,qualityassurance,qualityassessment, quality control, quality control charts, six sigma process, accreditation andcertification.

UNITII:PROTEINSTRUCTUREANDFUNCTION

1. **Aminoacidsandpeptides-**
   Classificationandreactionsofaminoacids,peptidebond,biologicallyactivepeptides, amino acids separation techniques.
2. **Proteins-**
   Properties,functions,classification,organisationofproteins,sequenceanalysisofproteinstructure,proteinmisfolding,quantitativeestimationofproteins,clinicalaspects.
3. **Plasmaproteins -**Functionsandclinicalsignificanceofplasmaproteins.
4. **Enzymes-**
   Classificationandnomenclature,coenzymes,modeofactionofenzymes,catalysis, enzyme kinetics, factors affecting enzyme activity, regulation of enzyme activity,enzyme inhibition,isoenzymes,enzyme assaymethods,enzymesinclinicaldiagnosis,therapeutic enzymes.
5. **Hemeproteins -** Structure, function of Hemoglobin, myoglobin, oxygen dissociation curve,allostericeffects, minor hemoglobins, hemoglobinopathies.

UNITIII:OVERVIEW OFMETABOLISM

1. Metabolicadaptationsduringfasting,starvationandunderwellfedstate,interconversionofmetabolicfuels.
2. Metabolic profile of organs, brain, skeletal muscle, cardiac muscle, adipose tissue, liver,heart, kidney,erythrocytes, metabolic changes during, pregnancy, lactation, trauma &criticalillness.

UNITIV: BIOENERGETICSANDCARBOHYDRATEMETABOLISM

1. **Biologic oxidation, respiratory chain andoxidative phosphorylation -** Role of highenergy phosphates, redox potential, enzymes involved in oxidation reduction reactions,electrontransportchain,transportsystems,Oxidativephosphorylation, clinicalaspects.
2. **Citricacid cycle**-Amphibolicrole,reactions, energeticsand regulation.
3. **MetabolismofCarbohydrates-**Functions, classification, properties and reactions ofcarbohydrates,glycosaminoglycans,Dietarycarbohydratemetabolism,glucosetransporters, glycolysis and the oxidation of pyruvate, metabolism of glycogen, pentosephosphate pathway and other pathways of hexose metabolism, gluconeogenesis and controlof blood glucose, Diabetes mellitus and itslaboratory diagnosis, metabolism of alcohol,aminosugars,bloodgroupsubstances,glycosaminoglycans,proteoglycansandglycoproteins,clinical aspects of carbohydrate metabolism .

UNITV: LIPIDMETABOLISM

1. **MetabolismofLipids**-
   Functions,classification,propertiesoflipids,fattyacids,prostaglandins, ecosanoids. Dietary lipid metabolism, oxidation & biosynthesis of fattyacids,diseasesassociatedwithimpairedfattyacidoxidation,phospholipid,glycospingolipid and ecosanoid metabolism, ketone body and acylglycerolmetabolism,lipid transport and storage, metabolism of adipose tissue, fatty liver, lipotropic factors,cholesterol metabolism, role of dyslipidemia in atherosclerosis and cardiac biomarkers,clinicalaspects of lipidmetabolism.

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UNITVI: PROTEINANDAMINOACIDMETABOLISM

1. **Amino acid metabolism -**Dietary protein metabolism , catabolism of proteins and aminoacid nitrogen, metabolism of ammonia, urea cycle and related disorders, catabolism ofcarbonskeletonsofaminoacids,conversionofaminoacidstospecialisedproducts,synthesisofnutritionallynonessentialaminoacids.metabolicdefectsinaminoacidmetabolism.
2. **Hemesynthesisandbreakdown-** Structure,biosynthesisanddegradationofheme,porphyrias,bilirubin metabolism, jaundice.

UNITVII:NUCLEOTIDE METABOLISM

1. **Metabolism of nucleotides -** Biosynthesis, degradation andregulation of purineandpyrimidinenucleotides, disorders ofpurine and pyrimidinemetabolism.

UNITVIII:NUTRITION

1. **Energymetabolismandnutrition**- Energyrequirementsinhumans,importanceofdietary fats, carbohydrates and proteins, calorific value of foods, respiratory quotient, Basalmetabolicrate(BMR),Specificdynamicaction(SDA),dietaryfibers,balanced diet,glycemicindex,enteralandTotalparenteralnutrition,NutritionalDisorders- Proteinenergymalnutrition (PEM), obesity,atherosclerosis.
2. **Electrolytes,waterbalanceandbodyfluids-** WaterBalance,sodium,potassium,chloride,magnesium, clinical aspects .
3. **Mineral metabolism -** Major elements and trace elements, clinical conditions resultingfromdeficiencyorexcess of minerals.
4. **Vitamins-** Sources, biochemical functions,RDA, clinical features, role in health anddisease.

UNITIX:HORMONES

1. Classificationofhormones,mechanismofactionofendocrinehormones.
2. Production,transportand storageofhormones,clinicalaspects.

UNITX:STRUCTURE,FUNCTIONANDREPLICATIONOFINFORMATIONALMACROMOLECULES

1. **Nucleotidesandnucleicacids-** Compositionofnucleotides,syntheticnucleotides,Structure , functions andhigher organisationofDNA, structure, types and functions ofRNA.
2. **Molecular genetics, Recombinant technology and genomic technology-** Principles ofheredity, laws and patterns of inheritance, basic procedures and techniques involved inrecombinantDNAtechnologyandgeneticengineering,applicationsofrecombinanttechnology,DNA hybridization techniques,DNA sequencing.
3. **DNAorganisation,replicationandrepair–** chromatin,higherorderorganisation,chromosomes, human mitochondrial DNA, cell cycle, DNA recombination, mechanism ofreplication in prokaryotes and eukaryotes, inhibitors, DNA repair mechanisms, diseasesassociatedwith defectiverepair mechanisms.
4. **RNAsynthesis-** Mechanismofsynthesisinprokaryotesandeukaryotes,inhibitors,modifications,r

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eversetranscription.

5. **Proteinsynthesisandthegeneticcode**- Characteristicsof geneticcode,mutations,Wobblehypothesis,mechanismofproteinsynthesisinprokaryotesandeukaryotes,inhibitors, post-translational processing.
6. **Regulationofgeneexpression**- Regulationofgeneexpressioninprokaryotesandeukaryotes,geneamplification, epigeneticmodifications, motifs.

UNITXI:INBORNERROR OFMETABOLISM

1. Molecularbasisofgeneticdisease,consequencesofgeneticdisease,diagnosisand treatmentof inborn errorofmetabolism.
2. Prenataldiagnosis,geneticcounselling.

UNITXII: ORGANFUNCTION TESTS

1.Liver,renal,gastric,adrenal, thyroid,pancreaticfunctiontests,clinicalaspects.

UNITXIII: SPECIAL TOPICS-A

1. **Theextracellularmatrix(ECM)**- Structuralandfunctionalpropertiesofcollagen,elastin, and other important proteins of ECM, bone and cartilage, associated diseases ofECM.
2. **Immunochemistry –** Antigen, immune response, antibody diversity, structure , classes andfunctionsofimmunoglobulins,transpositionofgenes,monoclonalantibodies, Majorhistocompatibilitycomplex (MHC), complementsystem**,** vaccines**,** Paraproteinemias.
3. **Muscle biochemistry -** Protein composition of Skeletal muscle, Mechanism of MuscleContraction,Sourceof Energyin MuscleContraction, MuscleDisorders**.**
4. **Metabolismof xenobiotics-**Phasesofxenobiotic metabolism,effectsofxenobiotics.
5. **Bodyfluids-** Milk, colostrum, cerebrospinal fluid, amniotic fluid, ascitic fluid, pleuralfluid,aqueous humor.
6. **Enviornmental biochemistry** - Air pollutants, toxic substances in food stuffs, neurotoxins,heavy metal poisoning, occupational and industrial hazards, corrosives and irritants, effectofextreme climateconditionson health,diseasesassociatedwithenvironmental pollutants.
7. **Radioisotopesin medicine-** Useofradioisotopesindiagnosis,treatmentandresearch.

UNITXIV: SPECIAL TOPICS-B

1. **Biochemistry of cancer**- Growth characteristics of cancers cells, carcinogenesis, causes ofgeneticdamage,oncogenes,tumorsuppressorgenes,apoptosis,biochemicalbasisofcancertherapy,tumourmarkers,anticancerdrugs,epigeneticmechanismsinvolvedincancer,clinicalaspects.
2. **Biochemistryof AIDS**-Laboratorydiagnosisof AIDS.
3. **Biochemistryof aging-**Theoriesof aging.
4. **Free radicals and antioxidants**– Sources of oxygen radicals in the body, free radicalscavengersystems,antioxidantsasprooxidants,lipidperoxidation,freeradicalsanddiseases.
5. **Bioinformatics and computational biology-** Genomics, human genome project,bioinformaticand

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genomic resources, identificationof proteins.

6. **Evidencebasedlaboratorymedicine(EBM)-** Concept,definitionandobjectivesofEBM,applying principles of EBM in routinepractice.
7. **Acidbasebalance-**Acidsandbases,Henderson-Hasselbalchequation,Buffersystems,regulationof pH,Aniongap,disturbances inacidbasebalance,clinical aspects.

- **Recent advances and developments in the discipline.**

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4-PATHOLOGY

RecentAdvances Topics

1	Antibody-mediatedrejectionofsolidorganallografts.
2	The maternaldeathautopsy.
3	Classificationandtreatmentof non-small-celllungcarcinoma.
4	Pathologyof obesity.
5	Stratifiedmedicinefor cancer:theroleof the histopathologist.
6	MucosalpathologyofthegastriccardiaandBarrett'soesophagus.
7	Pathologyofregenerativeandneoplastichepatocellularnodules.
8	Serratedlesionsof colonandrectum.
9	Anupdateonthepathologyof chronicinflammatoryboweldisease.
10	DiagnosisandtherapyofgastrointestinalMALTlymphoma.
11	Medicalrevalidationforhistopathologists.
12	Moleculartestingforhumanpapillomavirus.
13	Tensinsin healthanddisease.
14	Pathologyintheundergraduatecurriculum.
15	Primarycarcinomaofthesalivarygland–SelectedRecentAdvances.
16	Cancerinvasionandmetastasis-Theconcept of epithetial mesenchymaltransition.
17	Matrix metalloproteinases(MMP)inneoplasticprogression– Where arewenow?
18	Osteoarthritis–Newconcepts
19	Cutaneouspseudolymphoma.
20	LiquidbasedcytologyforCervicalScreening.
21	Pitfallinthediagnoses ofSofttissuetumours ofchildhood.
22	SuddenunexpecteddeathinInfancy.
23	TheNoninvasiveor minimallyinvasiveautopsy.
24	Bio-terrorism.
25	Predictiveandprognostic molecularmarkersinbreastcancer.
26	Digitalphotographyin histopathology.
27	Adultstemcellsandtransdifferentiation.
28	RoleofImmunohistochemistryinproblematicprostatebiopsy.
29	Cytokeratinimmunostainingprofileindiagnosticpathology.

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1 **CellInjury**

- Causeandmechanism:Ischemic, Toxicand Apoptosis.
- Reversiblecellinjury: Types,morphology, hyaline,fattychange.
- Irreversiblecellinjury :Typesofnecrosis, gangrene.
- Calcification:Dystrophicand metastatic.
- Extracelluleraccumulation:Amyloidosis,classification,pathogenesis,morphology.

2 **Inflammationandrepair**

- Acuteinflammation :features,causes,vascularandcellular events.
- Morphologicalvariantofacuteinflammation.
- Inflammatorycellsandmediators.
- Chronicinflammation:causes,types,non-specificandgranulomatouswithcommonexamples.
- Woundhealingbyprimaryandsecondaryunion,factorspromotinganddelayingtheprocessandcomplications.

3 **Immunopathology**

- Immunepathology:organization,cells,antibodiesandregulationsofimmuneresponses.
- Hypersensitivity:typesandexamples,antibodiesandcellsmediatedtissueinjurywithexamples.
- AutoimmunedisorderslikeSystemicLupusErythematosus.
- Organtransplantation:immunologicalbasisofrejectionandgraftversushostreaction.

4 **Infectiousdiseases**

- Mycobacterialdiseases :tuberculosisandleprosy.
- Bacterialdiseases:pyogenic,typhoid,diphtheria,gram-veinfections,bacillarydysentery, syphillis.
- Viral:polio,herpes,rabies,measles,reckettsial,chlamydialinfections.
- Fungaldiseaseandopportunisticinfections.
- Parasiticdiseases:malaria,filarial,amoebiasis,kalaazar,cystecercosis,hydatid.
- AIDS:etiology,modesoftransmission,pathogenesis,pathology,complications,diagnostic proceduresandhandlingofinfectedmaterialsandhealtheducation.

5 **Circulatorydisturbances**

- Oedema:pathogenesis andtypes.
- Chronicvenouscongestion:lung,liver,spleen.
- Thrombosisandembolism:formation,fateandeffects.
- Infarction:types,commonsites, gangrene.
- Shock:pathogenesis,types, morphologicalchanges.

6 **Growthdisturbances**

- Atrophy,hypertrophy,hyperplasia,hypoplasia,metaplasia,malformation,agenesis,dysplasia.

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- Neoplasia:causes,classification,histogenesis,biologicalbehaviour,benignandmalignant, carcinomaandsarcoma.
- Malignantneoplasia:gradesandstages,localanddistantspread.
- Carcinogenesis : Environmental carcinogen, chemical, viral, occupational,hereditaryandbasicsofmolecularbasisofcancer.
- Tumourandhostinteraction:systemiceffectsincludingparaneoplasticsyndrome,tumourimmunology.
- Laboratorydiagnosis:cytology,biopsy,tumourmarkers.
- Tumoursandtumourlikeconditionsof softtissues.

7 Miscellaneousdisorders

- Autosomalandsex-linkeddisorderswithexamples.
- Proteinenergymalnutritionandvitamindeficiencydisorders.
- Radiationinjuries.
- Disordersofpigmentsandmineralmetabolismsuchasbillirubin,melanin,haemosiderin.

8 Haematopathology

- Anaemia:classificationandclinicalfeatures.
- Nutritionalanaemia:Irondeficiency,folic acid/vit.B12deficiencyanaemiaincludingperniciousanaemia.
- Haemolyticanaemia:classificationandinvestigation.
- Herediataryhaemolyticanaemia:thalassemia,sicklecellanaemia,hereditaryspherocytosisandG6PDDdeficiency.
- AcquiredHemolyticanemias :malaria, KalaAzar.,Autoimmune,alloimmune,druginduced,microangiopathic.
- Haemostaticdisorders:plateletdeficiency,ITP,druginduced,secondary.
- Coagulopathies:coagulationfactordeficiency,hemophilia,DICandanticoagulantcontrol.
- Leucocyticdisorders: Leucocytosis,leucopoenia,leukemoidreaction.
- Acuteandchronicleukemia:classificationanddiagnosis.
- Multiplemyelomaanddysprotenemias.
- Bloodtransfusion:groupingandcrossmatchinguntowardreactions,transmissibleinfectionsincludingHIVandhepatitis.
- Myelodysplasticsyndrome.
- Myeloproliferativedisorders:polycythemia,myelofibrosis.

9 CardiovascularPathology

- Acute Rheumatic fever : etiopathogenesis and morphological changesandcomplicationsincludingrheumaticheartdisease.
- Infective endocarditis : etiopathogenesis and morphological changes andcomplications.
- Atherosclerosisandischemicheartdisease:myocardial infarction.
- Hypertensionandhypertensiveheartdisease.
- Congenitalheartdisease:ASD,VSD,Fallot'stetatology,BiscuspidaorticValvePDA.
- Pericarditis.

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- Cardiomyopathy.

10 RespiratoryPathology

- Structureofbronchialtree andalveolarwalls, normalandalteredinflammatorydiseasesofbronchi:chronicbronchitis,bronchiectasis.
- Pneumonias:lobar,broncho,interstitial.
- Lungabscess:etiopathogenesisandmorphologyandcomplications.
- Pulmonarytuberculosis:primaryandsecondary,morphologictypesIncludingpleuritis.
- Emphysema:type andpathogenesis.
- Tumours: EpithelialMalignantNeoplasmsof Lung,Etiopathogenesis.

Conceptsofobstructiveandrestrictivelungdisorders– Chronicbronchitis,emphysema,Asthma.

- Nasopharyngealand laryngealtumors.
- Occupationallungdisorders:anthracosis, silicosis,asbestosis, mesothelioma.
- Atelectasisandhyaline membranedisease.

11 Renal& Urinarytractpathology

- Basicsofimpairedfunctionandurinalysis.
- Glomerulonephritis:classification,primaryproliferativeandnonproliferative,secondary(SLE,polyarteritis,amyloidosis,diabetesmellitus).
- Clinicalpresentationofrenaldisordersincludingnephritic,nephroticsyndrome,acuterenalfailure, recurrent hematuria, CRF.
- Acuterenalfailure:acutetubularandcorticalnecrosis.
- Pyelonephritis,refluxnephropathy,interstitialnephritis.
- Renalcelltumors: renalcellcarcinoma,nephroblastoma.
- Urinarybladder:Cystitis,carcinoma.
- Progressiverenalfailureandendstagerenaldisease.
- Renalvasculardisorders.
- Urinarytracttuberculosis.
- Nephrolithiasisandobstructivenephropathy.
- Renalmalformationpolycystickidney.

12 PathologyofGastrointestinaltract

- Oralpathology:leukoplakia,carcinomaoralcavityandesophagus.
- Pepticulcer:etiopathogenesisandcomplications,gastritistypes.
- Tumorsofstomach:benign,polyp,leiomyoma,malignant,adenocarcinoma,othergastrictumors.
- Inflammatorydiseaseofsmallintestine:typhoid,tuberculosis,Crohn'sdisease,appendicitis.
- Inflammatorydiseaseoflargeintestine:amoebiccolitis,bacillarydysentery,ulcerativecolitis.
- Largeandsmallintestinetumors: polyps,carcinoid,carcinoma,lymphoma.

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- Pancreatitis.
- Salivaryglandtumors.
- Ischemicandpseudomembranous enterocolitis,diverticulitis.
- Malabsorption-coeliacdisease,tropicalsprue andothercauses.
- Pancreatictumors: endocrine,exocrineand pariampullary.

13 Liverand Billiary tractpathology

- Jaundice:types,etiopathogenesisanddifferentiation.
- Hepatitis:acuteand chronic,etiology,pathogenesisandpathology.
- Cirrhosis:etiology,classification,pathology,complications.
- Portalhypertension:typesandmanifestation.
- Diseasesofgallbladder:Cholecystitis,cholelithiasis,carcinoma.
- Tumorsof liver:hepatocelluler,metastatic, tumor markers.

14 LymphoreticularSystem

- Lymphadenitis:non-specific,granulomatous,Hodgkin'slymphoma.
- Non-Hodgkin'slymphoma,classification,morphology.
- Diseasesof spleen:splenomegalyandeffects.

15 Reproductivesystem

- Diseasesofcervix:cervicitis,cervicalcarcinoma, etiology,cytologicaldiagnosis.
- Hormonalinfluencesandhistologicalappearancesofdifferentphasesofmenstrualcyclesandtheabnormalityassociatedwithit.
- Diseasesofuterus:endometrialhyperplasiaandcarcinoma,adenomyosis, smoothmuscletomours.
- Trophoblasticdiseases:hydatiformmoleandchoriocarcinoma.
- Diseasesofbreast:mastitis,abscess,fibrocysticdisease,neoplasticlesions,fibroadenoma,carcinoma,phyllodestumors.
- Prostate:nodularhyperplasia,carcinoma.
- Ovarianandtesticulartumours.
- Carcinomaof penis.
- Pelvicinflammatorydiseaseincludingsalpingitis.
- Genitaltuberculosis.

16 Osteopathology

- Osteomyelities:acute, chronic,tuberculosis.
- Metabolicdiseases:rickets/osteomalacia,osteoporosis,hyperparathyroidism.
- Tumours:primary,osteosarcoma,osteoclastoma,Ewing'ssarcoma,chondrosarcoma,metastatic.
- Arthritis:rheumatoid, osteoidandtuberculosis.
- Healingof fractures.

17 Endocrinepathology

- Diabetesmellitus:types,pathogenesis,pathology.
- Nonneoplasticlesionofthyroid:Iodinedeficiencygoiter,autommunethyroi

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ditis,thyrotoxicosis, myxoedema.

- Tumors of thyroid : adenoma, carcinoma: pappilary, follicular, medullary,anaplastic.
- Adrenaldisease:corticalhyperplasia,atrophy,tuberculosis,tumorsofcortexandmedulla.
- Parathyroidhyperplasiaandtumors.

18 **Neuropathology**

- Inflammatorydisorders:pyogenicandtubercularmeningitis,brainabscess,tuberculoma.
- CNStumors-primarygliomaandmeningioma andmetastatic.
- CSFanditsdisturbances:cerebraloedema,raisedintracranialpressure.
- Cerebrovascular disease ; atherosclerosis, thrombosis, embolism, aneurysm,hypoxia,infarctionandhemorrhage.

19 **Dermato-pathology**

- Skintumors:squamouscellcarcinoma,basalcellcarcinoma,andmelanoma,adenexialtumourswith common non neoplasticskindiseases.

20 **Tumoursofsoft tissues**

- Routineprocessing&frozensections.
- Ancilliarydiagnostic tests,Immunohistochemistry, tumour markers&theirinterpretation.

21 **Moleculargenetics**

- HybridDNAtechniques&
- Applicationindiseases.

22 **Cytopathology**

- Collectionproceduresanddiagnosisinterpretation.
- Exfoliativecytologyofbodyfluids,urinarytracts,femalegenitaltract,Amnioticfluid&tears.
- FineNeedle AspirationCytology.
- Imprint,crushsmear,biopsysedimentcytology.
- BuccalsmearsforSex chromatinbodies.

23 **LaboratoryHi-techinstruments:Knowledgeabout**

- Tech.Procedures,principlesandclinicalinterpretationof testsusing.
- Haematologyauto-analysers,Flow-Cytometer,Polymerasechainreaction.(PCR)Electrochemiluminiscentimmunoassay(ECLIA).
- HighperformanceliquidChromatography(HPLC).
- ElectronMicroscope,PhaseContrastMicroscope.
- Fluorescent Microscope&Electrophoresis.

24 **Rationaluse&safeBloodTransfusion**:Bloodbankingprocedures&preparationofBloodComponentswiththeirstorage.

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25 **LabBiomedicalWaste**:Principlesofcollection,segregationanddisposal.

- **Recent advances and developments in the discipline.**

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5-MICROBIOLOGY

GENERALMICROBIOLOGY

HistoricalIntroduction:Microscopy,Micrometry,Laboratoryuse&careofinstruments inmicrobiology; Biosafety measures & containment facilities, shipment of microbiological material;SterilizationandDisinfection,Sterilitytesting,Sterilizationindicators;Nomenclatureandclassification of microorganisms, normal flora of human body, Microbiology of water, milk, air& itsapplication; collection, transportation and processing of clinicalspecimens for laboratory, diagnosisof infections, various culture medias, culture methods, stains and identification tests, maintenance ofstock cultures; Care, use & experimental techniques on laboratory animals; Microbial InfectionsMoleculargenetics andmicrobiological applications.

A. BACTERIOLOGY

Morphology,Physiology,Taxonomy,culturalcharacteristics,virulencefactors,antigenicity&mechanisms of drug resistance in bacteria, Anaerobiosis, Conventional & non-conventional (recent &molecular) methods for detection of bacteria of medical importance viz Gram positive cocci likestaphylococci,Streptococci,pneumococci,etc.,GramNegativecoccilikeNeisseria,peptostreptococci etc. Gram Negative bacilli like Enterobacteriacae family, Haemophilus Bordetella,Brucella & others including fastidious organisms and Gram positive bacilli like coryne bacterium, Banthracis,clostridium&Mycobactrium.TuberculosisandNontubercularmycobacteria,Mycobactrium leprae, Antinomycetes, Rickettsiaceae, orientia ehrlichia & coxiella, chlamydia andchlamydophilamycoplasmaandureaplasma,treponems,borellia,LaptospiraotherNonsporanaerobes miscellaneous/rarely encountered bacteria of medical importance; Identification of non-cultivable bacterial pathogens; Mechanisms of drug resistance in bacteria & choice of antibacterialagents.

B. IMMUNOLOGY

Infection and Immunity; Antigen, antibody, complement, Antigen-Antibody reaction with specialreference to simple, rapid & automated techniques like ELISA, Immuno chromatography, blottingtechniques etc.; Structure and Function of immune system, Immune response, detection methods andapplication;Hypersensitivity,Immunodeficiencydiseases,Autoimmunity;Immunologyoftransplantation&malignancy,HLAtyping&tissuematchingtechniques;useofmonoclonal.
antibodiesindiseasediagnosis,Immunoprophylaxis,Immunomodulation&Immunotherapy;Immunohaematology,Transfusiontransmissibleinfection(TTI)&useofexperimentalanimals(sucklingmice, SCID mice, Nudemice, Knock-outmiceetc.)in

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immunology.

C. MYCOLOGY

General properties, Nomenclature, classification & Morphology of fungi of medical importance;Epidemiology,pathogenesis,clinicalmanifestations,prevention,control&treatmentofFungalinfections; Lab diagnosis (Cultural techniques including Slide culture, Scotch tape preparation, Germtube test, Cornmeal agar inoculation & identification based on morphology, Sugar Fermentation &assimilationtests,Exo-antigentestaswellasnon-culturaltechniqueslikeserology,animalinoculation, & molecular methods) of various fungal infections viz-coetaneous, subcutaneous, Deep,Systemicandopportunisticmycosescausedbyyeasts,yeast-likefungi,hyalohyphomyces,Phaehyphomyces,Phycomycetes&dimorphicfungi;Anti-fungaldrugs&in-vitroantifungalsusceptibilitytesting and mechanism of drug resistance.

D. VIROLOGY

General properties, Nomenclature, classification, replication, cultural and non-cultural methods oflaboratory diagnosis of various viruses & infections caused by them. Special techniques of virusculture eg-shell vial culture, egg inoculation; collection & transportation & processing of samples forviral disease diagnosis,recentadvances in techniques for virus detection; Virus-host interactions,viral genetics & pathogenesis of viral infections caused by various viruses of human importance. viz -DNA viruses, RNA viruses, Bacteriophage Slow Viruses including prions and conventional viruses &oncogenicviruseswithspecialreferencetoHepatitis&HIV;miscellaneousviruses,-SARS&corona, zika viruses, Avian influenza virus; Viral haemorrhagic fevers etc. Viral vaccines & antiviraldrugs.

E. PARASITOLOGY

GeneralIntroduction:

Taxonomy,Host,Hostparasiterelationship,transmissionepidemiology,lifecycle, pathogenesis, Immunologyand laboratorydiagnosis and treatmentofvariousparasites of medicalImportance.

- Introductiontoprotozoa,Generalfeaturesandclassification.
- Amoebaincluding free living amoeba
- IntestionalFlagellatesandGenitalFlagellates
- Hemoflagellates
- Malarialparasitesandbabesia
- Opportunisticcoccidianparasites
- Miscellaneousprotozoa
- Helaminthology:-Generalcharacterstics,morphologyandlifecycle
- Cestodes
- Trematodesorflukes
- IntestinalNematodes andnematodesofloweranimals
- Somaticnematodes
- Miscellaneousparasite andlabdiagnosis

F. APPLIEDMICROBIOLOGY,SCOPE&RECENTADVANCES

Biomedical waste management & techniques for proper disposal of infectious wastes; Monitoring ofdrug resistance in bacteria especially MRSA, VRSA, VISA, VRE & ESBL production in GramNegative bacilli; Hospital acquired infections & its control (HAI, HAICC); Epidemiological typingmethods&infectiousdiseaseoutbreakmanagement;Opportunisticinfections

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withspecialreferenceto HIV/ AIDS; Cost effective microbiological diagnostic techniqueswhich are simple& rapidaswell;Epidemiologyofinfectiousdiseasesincludinganthropod,zoonoses;Biological warfare&Bioterrorism;Genemanipulation,Geneticengineering,Genecloning,Genetherapy;Infectiousagents&cancerassociation;Emerging&reemerginginfectiousdiseases;Recentadvancesinmolecular diagnostic methods like PCR, TMA, DNA probe detection etc. Automation, quality controland assurance, antimicrobial therapy and drug resistance including antimicrobial stewardship, Newervaccinedevelopment against various infectious diseases

- Includingallpracticaltechniquesrelatedtotheabovementionedtopics&anyotherrelatedtopic(s)ofmicrobiological interest.

➢ **Recent advances and developments in the discipline.**

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6-PHARMACOLOGY

Unit–I-BasicandclinicalPharmacology

- Pharmacology-History&Development.
- Structureactivities, relationships&itssignificance.
- ChemicalnomenclatureasusedinPHARMACOLOGY.
- Passageofdrugacrossbiologicalmembranes.
- Absorptionand Distributionofdrugs: Binding ofdrugs to Plasmaproteins.
- Biotransformation,ExcretionofDrugs&Factorsaffectingthese.
- Mechanismofaction.
- Drug-Druginteractions&IatrogenicDisorder.
- Pharmacogenetics.
- Drugaddictionanditsmanagement.
- Teratogenicityand Carcinogenicityincluding methods fortheirstudy.
- DrugResistance.

Unit–II-Autonomic NervousSystem

- AnatomicalandPhysiologicalconsiderationof A.N.S.
- CholinergicAgonistsandAnti-cholinergicDrugs.
- Neuromuscularblockingagents,ScreeningofNeuromuscularblockingandGanglionicblockingagents.
- AnticholinesterasesagentandAnticholinesterases Reactivators.
- Receptormechanism,AdrenergicreceptorandtheirPharmacological characterization.
- Catecholaminebiosynthesis,release andfactorsaffectingthese.
- Catecholamine, their Pharmacologyand Therapeutics.
- NonCatecholamineSympathomimeticagents.
- Alfa&Betaadrenergic blocking agents.

Unit–III–CNS&PeripheralNervousSystem

- Physiologyand Pharmacologyofnuerohormonaltransmission in CNS.
- PathophysiologyandManagementofParkinsonism andotherneurodegenerativedisorders.
- Preanaestheticmedicationandstagesof anaesthesia.

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- GeneralAnaestheticagents.
- Localanaestheticandtheirscreening.
- OpioidreceptorsEnkephalinsandEndorphins.
- OpioidAnalgesicsandtheirantagonists.
- Analgesics,Antipyreticsandanti-inflammatoryagents.
- Antidepressantsdrugs.
- AntipsychoticsdrugsandLithium.
- Sedative&Hypnotics.
- Anti-anxietydrugs.
- Centrallyacting muscle relaxants andtheir screening methods.
- Alcohols.
- CNSStimulantsandcognitionenhancers.
- DrugAbuse.
- Antiepilepticdrugs.

Unit–IV-CardiovascularSystem

- Pathophysiologyandtreatment ofCardiac Arrhythmias.
- Pathophysiologyandtreatment ofCardiacfailure.
- PathophysiologyandtreatmentofIschamicHeartDiseases.
- Antihypertensivedrugs andtreatmentofHT.
- Drugsforperipheral vasculardisease.

Unit–V-Antimicrobial Agents

- IntroductionmechanismofactionandprinciplesofAntimicrobialstherapy
- Sulphonamides
- Beta-lactamsantibiotics
- TetracyclinesandChloramphenicol
- Aminoglycosides
- Macrolides
- QuinolonesandtreatmentofUrinarytractInfections.
- AntiamoebicDrugs.
- Antimalarialagents
- Anti-TubercularDrugs
- AntiLeproticDrugs
- Antifungalagents
- Antiviralagents
- Antihelmintics
- AntineoplasticAgents
- Miscellaneousantimicrobials.

Unit-VI-Endocrinology

- Androgensandanabolic steroids.
- Adrenalsteroids, Sex hormones&Anti-fertilityagents.
- Hypothalamicand pituitaryhormones.
- Pancreatichormones.
- Anti-diabeticagents.
- ThyroidandAnti-thyroiddrugs.
- CalciumMetabolism &Drugsaffectingbonemineralization.
- Drugsactingon theUterus.

Unit–VII -RenalSystem

- DiureticsandAntidiuretics.

Unit–VIII -Autacoids

- HistamineandAnti-Histaminics.
- 5-HT,itsAgonistsandAntagonists. Treatmentof Migraine.
- Prostaglandins, LeukotrienesandPlateletsActivatingFactors.
- Ergotalkaloids.

Unit–IX-RespiratorySystem

- TreatmentofCough, Bronchial AsthmaandCOPD.

Unit– X-GastrointestinalSystem

- Treatmentof acidpepticdiseases.
- EmeticsandAntiemetics.
- Drugsforconstipation,DiarroheaandInflammatoryBowelDiseases.

Unit–XI-Blood

- Haematinics,Erythropoietin.
- Coagulantsandanti-coagulants,Antiplatelets&Thrombolytics.
- Hypolipidemicdrugs.
- PlasmaexpandersandPharmacotherapyofshock.

Unit–XII-Miscellaneous Topics

- Antineoplasticagents.
- Immunotherapy.
- GeneTherapy.
- ChelatingAgents.
- Vitamins,Vaccines,Sera, Immunoglobulin.
- DermatologicalPharmacology.
- AntisepticsandDisinfectants.

Unit–XIII-AppliedPharmacology

- Vasoactivepeptides.
- Pharmacoeconomics.
- Pharmacogenetics.
- Pharmacoepidemiology.
- Drugsin sports and Doping test.
- Pharmacogenomics.
- Microdosing.
- AlternativestoAnimalexperiments.
- Roleofbiotechnologyinrecentdrug development.
- Roleoffreeradicalinhealthanddisease.
- Newerdrugdeliverysystem.
- NoblelaureatesinPharmacology.
- Pharmacovigilance

Unit–XIV–BiochemicalPharmacology

- Analyticalmethodsin PharmacologyandToxicology.
- Principals involved in identification and quantification of substances by - Chromatography –Spectrophotometry - Flame photometry - Spectro flouro photometry-HPLC and Gaschromatography-MassSpectrometry.
- PrinciplesofimmunologicalassaysincludingRadioimmunoassayandtheir importance.
- Tracertechniquesusingradioactivesubstancesandmeasurements.

Unit–XV–ClinicalPharmacology

- Generalprinciplesof

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clinicalPharmacologyi.e.dynamics,kinetics,ADR,andfactorsmodifyingdrug effects.

- Clinical pharmacokinetics concentration effect relationship&parameter , Targetconcentrationstrategies,Plateauprinciples,populationpharmacokinetics.
- Therapeuticdrugmonitoring.
- A.D.R.monitoringandprevention.
- Bioavailabilityand bioequivalencestudies.
- Plecebo.
- Designsandimplementationofclinicaltrials.
- Clinicaldrugdevelopmentalstudies(Phase1,2,3,4).
- Drugtherapyinextremes ofage(Neonate, Elder,Old).
- Drugtherapyin pregnancyand lactation.
- Iatrogenicdisorder.
- Prescriptionauditingandcriticalevaluationofresearchpapers,promotionalmaterialetc.
- Ethicalandlegalaspectinclinicaltrialsanddrugtherapy.

Unit–XVI-ResearchMethodology

- Keepingandbreedinglaboratoryanimals.
- Regulatoryguidelines(CPCSEA)and alternativestoanimalexperiments.
- Drugdevelopment(preclinicalandclinical).
- Drugregulations.Preclinicalin`vitroandinvivo.
- Bioassayanditsimportance.
- ScreeningmethodsinPharmacologyforevaluation ofdrugactivities onA-A.N.S. B-C.N.S (sedatives, hypnotics, psychotropics, anxiolytics, antidepressant, anti-convulsants,localanaesthetics,antiparkinsoniandrugs,NSAIDS,OPIOIDS). C-Respiratorysystem drugs. D-C,V,S(Anti-anginal,anti-hypertensive,anti-arrhythmic, drugsusedinCHF). E-Diureticscreening. F-G.I.TDrugs(Pepticulcer, emeticsandanti-emetics,anti-diarrhoealagents). G-Oxytocin andtocolytics. H-Hormones(Oral hypoglycemics, screeningof fertilityand anti-fertilityagents).
- Toxicitiesstudies-Acute/sub/chronic toxicitystudies in animals.
- Protocoldesigningandwritingofthesis.
- Writingofpapers,reports, reviewofscientificjournals.

Unit-XVII– Biostatistics

- Normaldistribution,randomnumbers.
- Meanmode,median,standardDeviation,StandardError.
- ZTestandPValues.
- Studentttest(pairedandunpaired),chi-squaretest.
- Nonparameter testforone, twoand Ksampleproblems.
- ANOVA.
- Correlation,simplelinearregressionandmultiplelinearregression.
- Epidemiologicalstatistics.

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7-FORENSICMEDICINE

1. Lawin RelationtoMedicalMan.
2. Legal procedure, Inquest Different types of courts & Powers of different courts,Medico legal Reports, Dying declaration/ Dying Deposition, Medical Witness.Professional secrecy / Privileged communication, Professional Negligence /Contributory negligence Warning Notice/ infamous conduct, vicarious Liability&consent.
3. MedicolegalautopsyincludingDecomposed&mutilatedbodiesExaminationofSkeleton/ Exhumation.
4. Death&Postmortemchanges,Modesofdeath/suddenDeath,Momentofdeath/ PresumptionofDeath.
5. IdentificationofLiving&DeadDeterminationofRace,Sex,Age&theirMedicolegalaspects,Includingfingerprints&DNAFingerPrint,Anthropometry,Scars,Tattomarks,Occupationalmarks,Intersex &Teeth.
6. Examination of Blood Stains, Seminal stains, Hairs & Fibre Forensic ScienceLaboratory&Artefacts.
7. ViolentAsphyxialDeathIncludingHanging,Strangulation,Throttling,Suffocation, Drowning,TraumaticAsphyxia,Cafecoronary.
8. Thermal injuries Including Burns, Scalds, Cold & Heat, Electricity, Lightening&Radiation.
9. Mechanical Injuries & their Medico Legal Aspects; including Ante mortem &post morteminjury,Determinationof age of injury.
10. RegionalInjuriesincludingskullfracture,IntracranialHaemorrhages,Cerebralconcussion,Countercoupeinjury,Spinalinjurychest&Abdominalinjury.
11. Impotance&Sterility,ArtificialInseminationVirginity,Signs ofPregnancy&delivery&their MedicolegalAspect.
12. Sexualoffences,Rapeincluding–recentchangesintheLawofRape. Un-NaturalSexualoffences&VariousSexualperversions.
13. **Natural&Criminalabortion:**MTPAct1971,PCPNDTAct,DutyofDoctor in criminal abortion, Infanticide – Including Live born, Dead born, Stillborn&RelatedTests.
14. **ForensicPsychiatry:**Delirium, Delusion Hallucination, Impulse,Psychosis&Neurosis,I.Q.,MentalHealthAct1987,Real&FeignedMentalillness,RestraintoftheMentallyillperson,Civil&CriminalResponsibilityofInsane.
15. **Forensic Toxicology:** General Considerations, Sale of Poison withReferencetovariousacts,DangerousDrugsAct,Classificationof Poisons,ActionofPoison&itsmodifications,Diagnosisofpoisonin Living&Dead,PreservationofViscera,DutiesofPhysicianincaseof suspectedpoisoning.
16. Corrosivepoison,Non-Metallicpoison,MetallicPoison&theirMedico-legalaspects Including clinicalPicture,treatment P.M.findings.
17. Insecticide&Weedkillers,OrganicirritantIncludingSnakesBiteFoodpoisons.
18. SomniferousPoisonsincludingOpium&DerivativesInebriantPoisonsIncludingEthyl&Methylalcohol,DeliriantpoisonincludingDhatura,Canabis, Cocaine, Drug addiction, Drug dependence, ManagementofDrugAddict.
19. CardiacPoison–Aconite&HCN,SpinalPoisons,Asphyxiants–IncludingCO,Sewar Gases&War Gases.

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8A-COMMUNITYMEDICINE (Assistant Professor/Assistant Professor, I/c UTHC/RTHC) [Level-11]

1 History, Concepts and Practice of Community Medicine, Evolution ofMedicineandpublichealthservices,principlesofPreventive,SocialandCommunityMedicine.Communitydiagnosis,Mandelian'slaw&GenaticDiseasesandGenetic counseling.

2 Concepts of Health and Disease, Dimensions of Health and disease, determinantsof health, ecology of health, indicators of health and disease, dynamics of diseasetransmission, Iceberg phenomenon, levels of prevention and interventions, lifestylediseases.

3 Socialandbehaviouralsciences(Sociology,SocialPsychologyandSocialAnthropology); concepts of society and culture, family and community structure,itscharacteristicsandfunctions,groupdynamics,leadershippatterns,socialstratification,socialchanges,urbanizationanditsproblems,principlesoflearning, process of communication, cultural factors in relation to health anddisease,socialstressanddeviantbehaviour,medico-socialwork,hospitalsociology,HealthProblems of UrbanSlums.

4 Introduction of Biostatistics and health statistics; Census and other sources ofdata; collection and presentation of data; Measures of central tendency, Measuresof variability; elementary statistical analysis; tests of significance; sampling andsampling procedures; designing of experimental and community based studies;scope; sources and uses of health; Testing of hypothesis; life table. Co relationand regression analysis, Types of Research Methadology and its importance inHealth.

5 Appliednutrition;PrinciplesofNutrition;nutritionalrequirements;balanceddiets; deficiency diseases; nutritional assessment; ecology of malnutrition and approaches tocontrol malnutrition; food toxins; food processing and preservation of various foodstuffs; nutritive value of commonly consumed food articles; diet and diseases; foodAdditivesfortificationandenrichment;Nationalprogrammesrelatedtonutrition.Nutrition monitoring&Surveillance,FoodSecurityAct.

6 Personalandenvironmentalhealth;controlofphysicalandbiologicalenvironments for prevention of diseases and promotion of health; water; air;humidity;ventilation;light;radiation;noiseandhousingandtheireffectonhealthandpreventivemeasures;meteorologicalenvironmentandmeasuringequipment.Assesmentof portable water.
Disposal of wastes- Types, methods of collection, Storage and disposal, Safedisposal of Human excreta, municipal waste, camp sanitation. Disposal of Ewaste,Global Warming, Pre&Post ExposureProphylaxisinHealth Care.

7 Definition – Preparedness and Response to Natural disasters.Types of Disasters.
ResponsetoDisaster,Triage.
NationalDisasterManagementAuthority.ImpactonHealth.

8 Classification&ManagementofBiomedicalwasteinHospitalanditsrelatedlegislation.

9 Health Education – Objectives, Approaches, Principles and Methods.CommunicationinHealth,its type andmode.

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Counselingin Health.
GATHERapproachanditsapplicationinrelatedHealthandDisease.

10 Aims of Epidemiology its uses, epidemiological approaches, rates and ratios;measurement of morbidity and mortality; epidemiologicalstudies; associationand causation; infectious disease epidemiology; disease transmission, principlesand methods ofdiseasecontrol,investigationofepidemics,IDSP.

11 Immunity;activeandpassiveimmunityandimmunizingagents,Historytorecents Development and Adverse events after vaccination, evaluation of vaccinecoverageinthecommunity. cold chain,National Immunizationschedule.

12 Conceptsofscreeningfordisease;usesofscreening,typesofscreening.Evaluation &screeningtest.

13 Epidemiology of CVD, CHD, DM, HT, cancers, obesity, Blindness & Accidents.Nationalprogramme relatedto Non-Communicable Disease.

14 Epidemiology and prevention of communicable disease – Air borne, intestinalarthropodborneinfections,Zoonosticdisease,surfaceinfections;STD,HIV/AIDS;emergingandreemerginginfectiousdiseases,FoodPoisoning,Parasiticinfestations,HospitalAcquiredInfection,CriteriasfordiseaseEradication&Elimination,NationalProgrammesrelatedtovariouscommunicabledisease.

15 Maternal and child health problems; ante-natal, natal and post-natal care; socialobstetrics; care of infants and children; low birth weight; infant feeding andweaning; growth and development; care of pre-school children; under five clinic;rightsofachild;indicatorsofMCHcare;socialPaediatrics;schoolhealthservices, care of handicapped children; behavioral problems in children; childlabouretc.,ICDS,NHM,ReproductiveandChildHealth– IMNCI,SchoolHealthServices,AdolescentHealth,Genderissuesandwomenempowerment,PCPNDTAct.
PEM&Malnutritiontreatment centre.

16 Preventive geriatrics – health problems of aged and remedial measures, Actionstowards Healthy ageing, National Policy on Older Persons, Geriatricsabuse,Benefitstosenior citizens.

17 Demography, Demographic cycle, Demographic Variables and trends, WorldPopulationTrend,Population ProbleminIndia,SocialMarketing Programmes in Health&FamilyWelfare,FamilyWelfareServices– familyplanning,contraceptivemethods,MTP,approachesinfamilyplanningetc.,NationalPopulationPolicy,Evaluationofcontraceptivemethods,fertiligyindicators.

18 Occupational health – physical, chemical, biological and psychological hazards,principles of prevention, industrial toxicology-lead, arsenic, chromium, mercuryand various gases – sulfur dioxide, carbon monoxide, hydrogen sulphide andfluorine, Ergonomics, occupational accidents, sickness absentism, Legislationincluding ESIAct,Socialsecurityofwomanin Industry.

19 Mental health – types of mental illnesses and prevention; mental health service inIndia; Alcoholism, Drug dependence & addiction, smoking hazards preventionand legislation.

20 Principles of administration process – planning, management and evaluation,VariousCommittee,healthpolicy,operationalresearch,HealthManagementFunctions,SupervisionasManagementtool,PERT,HealthCarefinancing,Management Problems&theirsolutions.

21 Threetiersystem,centre&statehealthcaresystem.

22 NationalHealthProgrammes&policies.PublicHealthLegislation.

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23 International and voluntary health agencies and their role in health sector. GlobalHealth Security and International Health Regulations, International Statisticalclassification of Disease and Related Health Problems, Public health aspect ofinternationaltravellesrs.,Bio-Terrorism,SDG.
24 UsesofITinCommunityMedicine,ComputerApplication &Telemedicine.
25 Research methodology
26 Principles of Epidemiology
27 Epidemiologic studies- descriptive, analytical, experimental
28 Biostatistics- (i) The scope and Uses of Biostatistics.
(ii) Collection, Classification and Presentation of Statistical Data.
(iii) Analysis and Interpretation of Data.
(iv) Obtaining Information and computing indices (rates and ratio) and making comparisons.
(v) Apply Statistical methods in Designing of Studies.
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b. Applying suitable test of significance.
c. Use of Statistical Tables.
29 Association & Causation

- **Recent advances and developments in the discipline.**

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8B- COMMUNITY MEDICINE (Epidemiologist-Cum-Assistant Professor)

1 History, Concepts and Practice of Community Medicine, Evolution ofMedicineandpublichealthservices,principlesofPreventive,SocialandCommunityMedicine.Communitydiagnosis,Mandelian'slaw&GenaticDiseasesandGenetic counseling.
2 Concepts of Health and Disease, Dimensions of Health and disease, determinantsof health, ecology of health, indicators of health and disease, dynamics of diseasetransmission, Iceberg phenomenon, levels of prevention and interventions, lifestylediseases.
3 Socialandbehaviouralsciences(Sociology,SocialPsychologyandSocialAnthropology); concepts of society and culture, family and community structure,itscharacteristicsandfunctions,groupdynamics,leadershippatterns,socialstratification,socialchanges,urbanizationanditsproblems,principlesoflearning, process of communication, cultural factors in relation to health anddisease,socialstressanddeviantbehaviour,medico-socialwork,hospitalsociology,HealthProblems of UrbanSlums.
4 Introduction of Biostatistics and health statistics; Census and other sources ofdata; collection and presentation of data; Measures of central tendency, Measuresof variability; elementary statistical analysis; tests of significance; sampling andsampling procedures; designing of experimental and community based studies;scope; sources and uses of health; Testing of hypothesis; life table. Co relationand regression analysis, Types of Research Methadology and its importance inHealth.
5 Appliednutrition;PrinciplesofNutrition;nutritionalrequirements;balanceddiets;

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deficiency diseases; nutritional assessment; ecology of malnutrition and approaches tocontrol malnutrition; food toxins; food processing and preservation of various foodstuffs; nutritive value of commonly consumed food articles; diet and diseases; foodAdditivesfortificationandenrichment;Nationalprogrammesrelatedtonutrition.Nutrition monitoring&Surveillance,FoodSecurityAct.

6 Personalandenvironmentalhealth;controlofphysicalandbiologicalenvironments for prevention of diseases and promotion of health; water; air;humidity;ventilation;light;radiation;noiseandhousingandtheireffectonhealthandpreventivemeasures;meteorologicalenvironmentandmeasuringequipment.Assesmentof portable water.
Disposal of wastes- Types, methods of collection, Storage and disposal, Safedisposal of Human excreta, municipal waste, camp sanitation. Disposal of Ewaste,Global Warming, Pre&Post ExposureProphylaxisinHealth Care.

7 Definition – Preparedness and Response to Natural disasters.Types of Disasters.
ResponsetoDisaster,Triage.
NationalDisasterManagementAuthority.ImpactonHealth.

8 Classification&ManagementofBiomedicalwasteinHospitalanditsrelatedlegislation.

9 Health Education – Objectives, Approaches, Principles and Methods.CommunicationinHealth,its type andmode.
Counselingin Health.
GATHERapproachanditsapplicationinrelatedHealthandDisease.

10 Aims of Epidemiology its uses, epidemiological approaches, rates and ratios;measurement of morbidity and mortality; epidemiologicalstudies; associationand causation; infectious disease epidemiology; disease transmission, principlesand methods ofdiseasecontrol,investigationofepidemics,IDSP.

11 Immunity;activeandpassiveimmunityandimmunizingagents,Historytorecents Development and Adverse events after vaccination, evaluation of vaccinecoverageinthecommunity. cold chain,National Immunizationschedule.

12 Conceptsofscreeningfordisease;usesofscreening,typesofscreening.Evaluation &screeningtest.

13 Epidemiology of CVD, CHD, DM, HT, cancers, obesity, Blindness & Accidents.Nationalprogramme relatedto Non-Communicable Disease.

14 Epidemiology and prevention of communicable disease – Air borne, intestinalarthropodborneinfections,Zoonosticdisease,surfaceinfections;STD,HIV/AIDS;emergingandreemerginginfectiousdiseases,FoodPoisoning,Parasiticinfestations,HospitalAcquiredInfection,CriteriasfordiseaseEradication&Elimination,NationalProgrammesrelatedtovariouscommunicabledisease.

15 Maternal and child health problems; ante-natal, natal and post-natal care; socialobstetrics; care of infants and children; low birth weight; infant feeding andweaning; growth and development; care of pre-school children; under five clinic;rightsofachild;indicatorsofMCHcare;socialPaediatrics;schoolhealthservices, care of handicapped children; behavioral problems in children; childlabouretc.,ICDS,NHM,ReproductiveandChildHealth–IMNCI,SchoolHealthServices,AdolescentHealth,Genderissuesandwomenempowerment,PCPNDTAct.
PEM&Malnutritiontreatment centre.

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29 Association & Causation

- **Recent advances and developments in the discipline.**

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8C- COMMUNITY MEDICINE(Statistician-Cum-Assistant Professor)

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2 Concepts of Health and Disease, Dimensions of Health and disease, determinantsof health, ecology of health, indicators of health and disease, dynamics of diseasetransmission, Iceberg phenomenon, levels of prevention and interventions, lifestylediseases.

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6 Personalandenvironmentalhealth;controlofphysicalandbiologicalenvironments for prevention of diseases and promotion of health; water; air;humidity;ventilation;light;radiation;noiseandhousingandtheireffectonhealthandpreventivemeasures;meteorologicalenvironmentandmeasuringequipment.Assesmentof portable water.
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29 Association & Causation

- **Recent advances and developments in the discipline.**

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8D- COMMUNITY MEDICINE(LADY MEDICAL OFFICER)

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2 Concepts of Health and Disease, Dimensions of Health and disease, determinantsof health, ecology of health, indicators of health and disease, dynamics of diseasetransmission, Iceberg phenomenon, levels of prevention and interventions, lifestylediseases.
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29 Association & Causation

- **Recent advances and developments in the discipline.**

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9-GENERAL MEDICINE

I. BASICSOFMEDICINE

- DecisionmakinginClinicalmedicine.
- Safetyand qualityofHealth Care.
- Promotinggoodhealth.
- EthicalissuesinClinicalMedicine.
- PrinciplesofClinicalPharmacology.
- Pharmocogenomics.
- Therapeutics&goodprescription.
- IntegrativeHealthPractices.
- InformationTechnologyinHealthCare.
- Lifestylediseases.

II. INFECTIOUSDISEASES

- Clinicalsyndromes-Communityacquiredinfections.
- Healthassociatedinfections.
- Diseasescaused byGram positive Bacteria.
- DiseasescausedbyGramNegativeBacteria.
- MycobacterialDiseases.
- FungalDiseasesandtheirTreatment.
- SpirochetalDiseases.
- RickettsialDiseases-Chlamydia/Mycoplasma.
- TherapyforBacterialDiseases.
- MiscellaneousBacterialinfections.

III. INFECTIOUSDISEASES

- Infectiondueto DNAvirus.
- InfectionduetoRNAvirus.
- InfectionduetoImmunodeficiencyvirus.
- ProtozoalInfection.
- HelminthicInfestation.
- Arthropod&RodentBorneDiseases.
- PrinciplesofInfectiousDisease.
- SexuallyTransmittedDisease.
- Infectionsdueto Human Immunodeficiencyvirus&otherRetro Virus.
- EvaluationofPyrexiaofunknownorigin.

IV. GERIATIC&WOMENHEALTH CARE

- Biologyofageing.
- MedicalDisordersofPregnancy.
- PalliativeandEndof Lifecare.
- Practiceof FamilyMedicine.
- ClinicalProblemsassociatedwithageingprocess.
- GeriatricGiants.
- DisorderduringAdolescence.
- SarcopenicObesity.
- Frailityin Elderly.
- Women&LeadershipinMedicine.

V. DISORDERSOFCARDIOVASCULARSYSTEM

- ApproachtoPatientofCardiovascularDiseases.
- HeartFailure.
- ValvularHeartDiseases.
- CongenitalHeartDiseases.
- PeripheralVascularDiseases&Hypertention.
- CoronaryHeartDiseases.
- Noninvasivecardiac Imaging.
- Bradyarrhythmias.
- Tachyarrhythmias.
- Cardiomyopathy&myocarditis.

VI. RESPIRATORYSYSTEM

- ApproachtoPatientwithRespiratoryDiseases.
- Occupational&EnvironmentalLungDiseases.
- COPD&Asthma.
- InterstitialLungDiseases.
- DiseasesofPleura&Mediastinum.
- DisordersofVentilation.
- SleepApnoea.
- LungTransplant.
- DiagnosticProcedures inRespiratoryDiseases.
- HypersensitivityPneumonias.
- Bronchiectasis &CysticFibrosis.

VII. CRITICALCAREMEDICINE

- ApproachtoPatientwithCritical IllnessAndClinicalprocedures .
- AcuteRespiratoryDistressSyndrome.
- RespiratoryFailure.
- MechanicalVentilatorySupport.
- Shock&Management.
- CardiacArrest &Sudden CardiacDeath.
- Coma.
- HypertensiveCrisis.
- AcidBaseDisorder.
- Fluid&ElectrolyteBalance.

VIII. DISORDEROF KIDNEY &URINARYTRACT

- AcuteKidneyInjury.
- Chronic KidneyDisease.
- Dialysis.
- RenalTransplant.
- GlomerularDisease.
- TubulointerstialDisease.
- VascularInjurytoKidney.
- DiabetesInsipidus.
- RenalTubularAcidosis.
- Bone&Mineral Metabolism.

IX. DISORDEROFG.I. SYSTEM

- ApproachtoG.I.Disease &LiverDisease.
- G.I.Endoscopy.

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- DiseaseofStomach&Esophagus.
- DisorderofAbsorption.
- InflammatoryBowelDiseases.
- IrritableBowelSyndrome.
- ViralHepatitis&Toxic Hepatitis.
- Evaluationof LiverFunction.
- AlcoholicLiverDisease.
- NonAlcoholicFattyLiverDisease.

X. RHEUMATOLOGY

- ImmuneSystemin Health&Disease.
- Anaphylaxis–Utricaria/ Angioedema.
- AutoimmuneDisorders.
- SLE&Antiphospholipidsyndrome.
- Spondyloarthitides.
- VasculitisSyndrome.
- Inflammatorymyopathies.
- Scleroderma&relateddisorders.
- RheumatoidArthritis.
- DisorderofJointandadjacenttissues.

XI. ENDOCRINOLOGY

- ApproachtoEndocrineDisorders.
- DisordersofNeurohypophysis.
- PitutaryDisorders.
- ThyroidandParathyroidglandDisorders.
- AdrenalGlandDisorders.
- AutoimmunePolyendocrineSyndrome.
- DisorderofSex Development.
- DisorderofMaleReproductiveSystem.
- DisorderofFemaleReproductiveSystem.
- Menopause&PostmenopausalHormoneTherapy.

XII. DIABETUIMMELLITUS &METABOLICSYNDROME

- Pancreatitis(Accuteand Chronic)
- Obesity
- MetabolicSyndrome
- DiabetesMellitus –Diagnoses &Classification
- GestationalDiabetesMellitus
- ManagementandTherapiesofDM
- ComplicationofDM
- LipoproteinMetabolism
- DisorderofIntermediaryMetabolism
- Hypoglycemia

XIII. NEUROLOGY-I

- ApproachtoDiseasesofNervousSystem.
- NeuroImaging.
- Seizures&Epilepsy.
- CerebrovascularAccidents.
- Migraine&otherHeadaches.
- Alzheimer'sDiseases &Dementias.

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- Parkinson'sDiseases.
- Movementdisorders.
- MotorNeuronDiseases.
- MultipleSclerosis.

XIV. NEUROLOGY-II

- AutonomicNervousSystem.
- DiseasesofCranialNerves.
- DiseasesofSpinalCord.
- InfectioninNeurology.
- PeripheralNeuropathies.
- NeuroMuscularJunction Disorders.
- MuscleDiseases.
- ChronicFatigueSyndrome.
- PsychiatricDisorders.
- Drugs&AlcoholDependance.

XV. HEAMATOLOGY

- StemCells&Transplant.
- Hypoproliferative&NutritionalAnaemia.
- Hemoglobinopathies&HereditaryAnaemia.
- BonemarrowFailure &Myelodysplasia.
- PolycythemiaVera&Myeloproliferative Disorders.
- TransfusionBiology.
- CoagulationDisorders.
- Arterial&VenousThrombosis.
- Antiplatelates,Anticoagulant&FibrinoliticDrugs.
- HaemolyticAnaemia.

XVI. ONCOLOGY

- AcuteLeukemias.
- ChronicLeukemias.
- Lymphomas.
- PlasmaCellDisorders.
- OncologyEmergencies.
- PrinciplesofCancerTherapies.
- SolidTumors.
- ParaneoplasticSyndrome.
- CarcinomaofUnknownPrimary.
- CancerGenetics.

XVII. POISONING,ENVIRONMENTAL& GENETICDISEASES

- HeavyMetal Poisoning&Drug overdose.
- MedicalTerrorism.
- SnakeBite.
- AltitudeIllnesses.
- ThermoregulatoryDisorders.
- FetalOriginofadultDiseases.
- Organophosphorus,Celphos &Other Poisoning.
- RadiationHazards.
- MicrobialGenome&InfectiousDiseases.
- PracticeofGeneticsin ClinicalMedicine.

XVIII. RECENTADVANCES&MISCELLANEOUS

- AdultImmunization.
- Sports&TravelMedicine.
- DietinMedicalDisorders.
- ResearchMethodology&EthicsofClinicalResearch.
- Exercise &YogainHealthDiseases.
- MedicalEvaluationofSurgicalPatients.
- RoleofEpigeneticsin Disease &Treatment.
- RoleofCircadianBiologyinHealth&Diseases.
- EmergingNeurotherapeuticTechnologies.
- TelomereDiseases&OtherRecentAdvances.

➢ **Recent advances and developments in the discipline.**

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10-TUBERCULOSIS & RESPIRATORY DISEASES

Unit-I

- HistoryofPulmonaryMedicineand TuberculosiswithemphasisonIndiancontribution.

Unit-II

- Development(embryology)growthandstructureofnormallung.
- Physiologicalprinciplesofnormallungfunctions.
- Lungsindifferentphysiological statese.g.exercise, pregnancy,ageing,high altitude,divingetc.
- CongenitalanomaliesofLung.

Unit-III

- Immunology, microbiology and various pharmacological aspects pertaining to respiratory diseases,Pharmacovigilence.

Unit-IV

- Approach to a patient with respiratory symptoms and signs diagnostic procedures in respiratorydisorders (radiographicimaging, interventional radiology, nuclear imaging, pulmonary functiontesting,arterialbloodgasanalysis,bronchoscopyandthoracoscopy,EBUS,Fenotest,Bronchoprovocationtest, aerosol therapy.

Unit-V

Pulmonaryinfections

- Acute/chronicrespiratorytractinfections,includingviralPneumonia-(swineflue).
- Pneumonia–Communityandhospitalacquired.
- Pneumoniainimmunocompromisedpatients.
- Nonresolvingpneumonia.
- Lungabscess.
- Bronchiectasis.

Unit-VI

Obstructiveairway disease

- Chronicobstructiveairwaydisease.
- Bronchialasthma.

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- Bronchiolitis.
- CysticFibrosis.
- Bullousdiseaseofthelung.

Unit-VII

Tumorsof thelungs

- Neoplasticandnon-neoplastic diseasesoflung.
- Solitarypulmonarynodule
- PleuralMesothelioma.

Unit-VIII

Smoking

- Practices,Epidemiology, illeffectsandcessation.

Unit-IX

DiffuseInterstitialLungDiseases.

- Idiopathicandnonidiopathicpulmonaryfibrosis.

Unit-X

- OccupationalPulmonaryDisordersincludingorganicandinorganicdustexposure.
- Airpollutionincluding indoorairpollution.
- Healthimpactsofglobal warming.

Unit-XI

- Druginducedpulmonarydisordersincludingradiationinducedinjury.
- Druginducedrespiratoryemergencies.

Unit-XII

PulmonaryCirculatoryDisorders

- Pulmonaryhypertensionandcorpulmonale.
- Acuterespiratorydistress syndrome.
- Pulmonarythromboembolicdiseases andinfarction.
- Pulmonaryarterio–venousmalformations.

Unit-XIII

Immunologicaldisorders

- Sarcoidosis.
- Hypersensitivitypneumonitis.
- Eosinophiliclungdisorders.
- Pulmonaryvasculiticdisorders.
- Connectivetissuediseases involvingthe respiratorysystem.

Unit-XIV

AlveolarDiseases

- Alveolarhemorrhage (PrimaryandSecondary).
- Pulmonaryalveolar proteinosis.
- Alveolarmicrolithiasis.

Unit-XV

Tuberculosis

- Immunologyandetiopathogenesis.
- Diagnosticmethods-conventionalandnewertechnique(CBNAAT,LPA,MGIT,BACTEC,MODS.)
- Differentialdiagnosis.
- Management ofpulmonarytuberculosis.
- Complicationsintuberculosisanditsmanagement.

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- Tuberculosisinchildrenandgeriatrictuberculosis.
- Milliaryanddisseminated tuberculosis.
- Mycobacteriaotherthan tuberculosis(MOTT).
- Extra pulmonary tuberculosis- lymph node, pleural, pericardial, genitourinary, intestinal,osteoarticular,CNS and skin.
- HIVandTB.
- PreventionandmanagementofMDRand XDRtuberculosis.
- DiabetesmellitusandTB.
- PneumoconiosisandTB.
- TreatmentofTB inspecial situations, includingMDR.
- Controloftuberculosis includingRNTCP, DOTS&DOTS PLUS.
- BCGvaccinationandMantoux testing.
- NationaltuberculosisEliminationprogram(NTEP).
- TuberculosisNotification.

Unit-XVI

DiseasesoftheMediastinum

- Developmentaldisorders.
- Benignand malignant (primaryand secondary)neoplasmsoflung.

Unit-XVII

Disordersof thepleura

- Pleuraldynamicsandeffusion.
- Non-neoplasticandneoplastic pleuraldiseases.
- Pneumothorax,HemothoraxandChylothorax.
- Pyothorax andbroncho-pleuralfistula.
- Managementofpleuraldiseases.

Unit-XVIII

CriticalCareinPulmonaryMedicine

- Principleofcriticalcaremedicine.
- Non-invasiveventilation.
- InvasiveMechanicalventilatorysupport.

Unti-XIX

Extrapulmonary manifestationsofpulmonarydiseases

Unit-XX

- SurgicalaspectsinrespiratorydiseasesincludingVATSandPleuroscopy,PreandPostoperativeevaluationof thoracic surgical patient.

Unit-XXI

- Depositionalandinfiltrativedisorders.
- HistiocytosisX.
- Lymphangioleiomyomatosis.
- Inbornerrorsofmetabolismpertainingto lungs.

Unit-XXII

Sleep-relatedpulmonarydiseases

- Physiologyofsleep.
- DiagnosticPolysomnography.
- Managementofobstructivesleepapnoea.
- Othersleep-disorderedbreathingsyndromes.

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Unit-XXIII

- Diseasesof thediaphragm.

Unit-XXIV

- Disordersofchestwall.

Unit-XXV

- Lungtransplantation.

Unit-XXVI

- PreventivePulmonology-Preventionofairborninfectionandvaccinationinpulmonologydiseases.

Unit-XXVII

- Current trends, Recent advancement in field of tuberculosis,Respiratory medicine including, Lasertheraphy, Coiling treatment of emphysema, **C**ryobiopsy, Ronchial, Thermoplasty, Bronchial arteryembolisation, Pulmonary Rehabilitation Programme, Palliative care in case of lung malignancy &ILD.

- **Recent advances and developments in the discipline.**

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11-DERMATOLOGY, VENEREOLOGY & LEPROSY

UnitI

History, Structure and Function of the Skin, Histopathology of the Skin : GeneralPrinciples, Diagnosis of Skin Disease, Epidemiology of Skin Disease, Genetics andtheSkin,Inflammation,ImmunologyandAllergy,Photobiology,CutaneousResponse toInjuryandWoundHealing,PsychologicalandSocialImpactofLong-termDermatologicalConditions,AdverseImmunologicalReactionstoDrugs,Topical DrugDelivery,ClinicalPharmacology.

UnitII

PrinciplesofHolisticManagementofSkinDisease,PrinciplesofMeasurementandAssessmentinDermatology,PrinciplesofEvidence-basedDermatology,Principles of Topical Therapy, Principles of Systemic Therapy, Principles of SkinSurgery,PrinciplesofPhototherapy,PrinciplesofPhotodynamicTherapy,PrinciplesofCutaneousLaserTherapy,Principlesof Radiotherapy.

UnitIII

Viral Infections, Bacterial Infections, Mycobacterial Infections, Leprosy, Syphilisand Congenital Syphilis, Other Sexually Transmitted Bacterial Diseases, HIV andtheSkin,FungalInfections,Parasitic Diseases,Arthropods.

Unit IV

PsoriasisandRelatedDisorders,PityriasisRubraPilaris,LichenPlanusandLichenoidDisorders,Graft-versus-hostDisease,EczematousDisorders,SeborrhoeicDermatitis,AtopicEczema,Urticaria,RecurrentAngio-oedemawithout Weals, Urticarial Vasculitis,

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Autoinflammatory Diseases Presenting in theSkin,Mastocytosis,ReactiveInflammatoryErythemas,Adamantiades–BehçetDisease,NeutrophilicDermatoses,ImmunobullousDiseases,LupusErythematosus, Antiphospholipid Syndrome, Dermatomyositis, Mixed ConnectiveTissue Disease, Dermatological Manifestations of Rheumatoid Disease, SystemicSclerosis,MorphoeaandAlliedScarringandSclerosingInflammatoryDermatoses.

UnitV

CutaneousAmyloidoses,CutaneousMucinoses,CutaneousPorphyrias,Calcification of the Skin and Subcutaneous Tissue, Xanthomas and Abnormalitiesof Lipid Metabolism and Storage, Nutritional Disorders Affecting the Skin, SkinDisordersinDiabetesMellitus.

UnitVI

Inherited Disorders of Carnification, Inherited Acantholytic Disorders, EctodermalDysplasias, Inherited Hair Disorders, Genetic Defects of Nails and Nail Growth,Genetic Disorders of Pigmentation, Genetic Blistering Diseases, Genetic DisordersofCollagen,ElastinandDermalMatrix,DisordersAffectingCutaneousVasculature, Genetic Disorders of Adipose Tissue, Congenital Naevi and OtherDevelopmentalAbnormalitiesAffectingtheSkin,ChromosomalDisorders,PoikilodermaSyndromes,DNARepairDisorderswithCutaneousFeatures,SyndromeswithPrematureAgeing,HamartoneoplasticSyndromes,InheritedMetabolicDiseases,Inherited Immunodeficiency.

UnitVII

Pruritus,PrurigoandLichenSimplex,MucocutaneousPainSyndromes,NeurologicalConditionsAffectingtheSkin,PsychodermatologyandPsychocutaneous Disease.

UnitVIII

Acquired Disorders of Epidermal Keratinization, Acquired Pigmentary Disorders,AcquiredDisordersofHair,Acne,Rosacea,HidradenitisSuppurativa,OtherAcquired Disorders of the Pilosebaceous Unit, Disorders of the Sweat Glands,Acquired Disorders of the Nails and Nail Unit, Acquired Disorders of DermalConnectiveTissue,GranulomatousDisordersoftheSkin,Sarcoidosis,Panniculitis,OtherAcquiredDisordersofSubcutaneous Fat.

Unit IX

Purpura, Cutaneous Vasculitis, Dermatoses Resulting from Disorders of the VeinsandArteries,UlcerationResultingfromDisorders of the Veins andArteries,DisordersoftheLymphatic Vessels,Flushing and Blushing.

UnitX

Dermatoses of the Scalp, Dermatoses of the External Ear, Dermatoses of the Eye,Eyelids and Eyebrows, Dermatoses of the Oral Cavity and Lips, Dermatoses of theMale Genitalia, Dermatoses of the Female Genitalia, Dermatoses of Perineal andPerianal Skin, Cutaneous Complications of Stomas and Fistulae, Dermatoses ofPregnancy,DermatosesoftheNeonate,DermatosesandHaemangiomasofInfancy.

UnitXI

BenignCutaneousAdverseReactionstoDrugs,SevereCutaneousAdverseReactions to Drugs, Cutaneous Side Effects of Chemotherapy and

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RadiotherapyDermatosesInducedbyIllicitDrugsDermatologicalManifestationsofMetalPoisoning, Mechanical Injury to the Skin, Pressure Injury and Pressure Ulcers,CutaneousReactionstoColdandHeat,BurnsandHeatInjury,Cutaneous Photosensitivity Diseases, Allergic Contact Dermatitis, Irritant Contact Dermatitis,Occupational Dermatology,Stingsand Bites.

UnitXII

Benign Melanocytic Proliferations and Melanocytic Naevi, Benign KeratinocyticAcanthomasandProliferations,CutaneousCysts,LymphocyticInfiltrates, CutaneousHistiocytoses,Soft-tissueTumoursandTumour-likeConditions,Tumours ofSkin Appendages, Kaposi Sarcoma, Cutaneous Lymphomas, BasalCellCarcinoma,SquamousCellCarcinomaanditsPrecursors,Melanoma,Melanoma ClinicopathologyMelanomaSurgerySystemicTreatmentofMelanoma, Dermoscopy of Melanoma and Naevi, Merkel Cell Carcinoma, SkinCancerinthe ImmunocompromisedPatient.

UnitXIII

CutaneousMarkersofInternalMalignancy,TheSkinandDisordersoftheHaematopoietic and ImmuneSystems, The Skin and Endocrine Disorders, TheSkinandDisordersoftheHeart,TheSkinandDisordersoftheRespiratorySystem, The Skin and Disorders of the Digestive System, The Skin and Disordersof the Kidney and Urinary Tract, The Skin and Disorders of the MusculoskeletalSystem.

UnitXIV

Skin Ageing, Cosmeceuticals, Soft Tissue Augmentation (Fillers), Aesthetic Usesof Botulinum Toxins, Chemical Peels, Lasers and Energy-based Devices, Plateletrich plasma PRPandPRFM,Autoinoculation.

- **Recent advances and developments in the discipline.**

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12-PSYCHIATRY

UNIT-I

HumanDevelopmentthroughouttheLifecycle

Death,Dying,andBereavement.Conceptofnormality,Mind-theevolvingconcepts.

TheBrain andBehavior

FunctionalandBehavioralNeuroanatomy,NeurophysiologyandNeurochemistry,Neuroimaging,Electrophysiology,Psychoneuroendocrinology,Psychoneuroimmunology,Chronobiologyand Neurogenetics.

ContributionsofthePsychosocialSciences

JeanPiaget,AttachmentTheory,LearningTheory,Aggression,SociologyandEthology,AnthropologyandCross-CulturalPsychiatry,Memory,Epidemiology,BiostatisticsandResearchMethodology.

Clinical Neuropsychological Testing.TheoriesofPersonalityandPsychopathology

SigmundFreud:FounderofClassicPsychoanalysis,ErikErikson,SchoolsderivedfromPsychoanalysisand Psychology.

UNIT-II

ClinicalExaminationofthePsychiatricpatient.Signsand Symptoms inPsychiatry.

ClassificationinPsychiatry

PsychiatricClassification, DSM-V&ICD-1O, ICD-11(Draft).

UNIT-III

Delirium, Dementia, Amnestic and Other Cognitive Disorders.MentalDisorders Dueto a GeneralMedical Condition.

Cognitive DisordersIntroductionand Overview,Delirium,Dementia,Amnesticdisorders,OtherCognitive Disorders andMental Disorders Dueto General MedicalCondition.

Substance-RelatedDisorders

Substance-RelatedDisorders:IntroductionandOverview.

UNIT-IV

SchizophreniaandOtherPsychoticDisorders

ConceptofSchizophrenia,ScopeoftheProblem,Genetics,EnvironmentalEpidemiology, DevelopmentalModelsofSchizophrenia,Neuroimaging,LinkingNeuropsychiatricManifestations to Neurobiology and Neuropathology of Schizophrenia. Clinical Features andPsychopathology, Psychosocial, Somatic, Psychiatric Rehabilitation and Integrative Treatment.FunctionalOutcomes,SchizophreniaSpectrumPathologyandTreatment,OtherPsychoticDisorders, Acute and Transient Psychotic Disorders, Brief Psychotic Disorder, SchizophreniformDisorder,DelusionalDisorderandSharedPsychoticDisorder,SchizoaffectiveDisorder,Postpartum Psychosis, Culture-Bound Syndromes with Psychotic Features, Psychosis N.O.S.,TreatmentofOtherPsychoticDisorders.SpecialIssuesinEarlyDetectionandIntervention.

UNIT-V

MoodDisorders

Historical,Introduction,ConceptualOverview,Epidemiology,Genetics,Neurobiology,Intrapsychic andInterpersonal Aspects,Clinical Features. Managementof Depression, ManiaandBipolar DisordersandPsychotherapy.

UNIT-VI

AnxietyDisorders(IncludingPanicdisorder,Agoraphobia,Phobias,OCD,PTSD,Acutestressdisorder, GADetc.)

Somatoform Disorders.FactitiousDisorders.

DissociativeDisorders.

UNIT-VII

NormalHumanSexualityandSexual&GenderIdentityDisorders.EatingDisorders.

SleepDisorders.

Impulse-Control Disorders.AdjustmentDisorders.

UNIT-VIII

PersonalityDisorders.

PsychologicalFactorsAffectingMedicalConditions

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HistoryofPsychosomaticMedicine,GastrointestinalDisorders,Obesity,Cardiovascular Disorders,RespiratoryDisorders,EndocrineandMetabolicDisorders,Psychocutaneous Disorders,MusculoskeletalDisorders,StressandPsychiatry,Psycho-Oncology,Consultation-LiaisonPsychiatry.

AdditionalConditionsthatmaybeafocusofclinicalattention

Malingering,AdultAntisocialBehavior,Criminality,andViolence,BorderlineIntellectual Functioning,AcademicProblemsandOtherAdditionalConditionsthatmay beafocusofclinicalattention.

UNIT-IX

Culture-Bound Syndromes.SpecialAreasof Interest

Psychiatry and Reproductive Medicine, Premenstrual Dysphoric Disorder, Genetic Counseling,End-of-Life and Palliative Care, Death, Dying, and Bereavement, Physical and Sexual Abuse ofAdults, Survivors of Torture, Alternative and Complementary Health Practices, Military andDisasterPsychiatry, FamousNamed Cases inPsychiatry, RelationalProblems.

UNIT-X

PsychiatricEmergencies

Suicide,OtherPsychiatricEmergencies

UNIT-XI

Psychotherapies.BiologicalTherapies

GeneralPrinciplesofPsychopharmacology,PharmacokineticsandDrugInteractions,DrugDevelopment and Approval Process. Medication-Induced Movement Disorders, Antihistamines,BarbituratesandSimilarlyActingSubstances,BenzodiazepineReceptor AgonistsandAntagonists,Bupropion, Buspirone, Calcium Channel Inhibitors, Cholinesterase Inhibitors andSimilarlyActingCompounds,DopamineReceptorAntagonists(TypicalAntipsychotics),Lithium, Mirtazapine, Monoamine Oxidase Inhibitors, Nefazodone, Opioid Receptor AgonistsMethadone, Levomethadyl, and Buprenorphine, Opioid Receptor Antagonists Naltrexone andNalmefene,SelectiveSerotoninNorepinephrineReuptakeInhibitors,SelectiveSerotoninReuptakeInhibitors,Serotonin-DopamineAntagonists(AtypicalorSecond-GenerationAntipsychotics),SympathomimeticsandDopamineReceptorAgonists,ThyroidHormones,Trazodone, Tricyclics and Tetracyclics, Electroconvulsive Therapy, Neurosurgical TreatmentsandDeepBrainStimulation,OtherPharmacologicalandBiologicalTherapies,DrugAugmentation,ReproductiveHormonal TherapyTheoryand Practice.

UNIT-XII

ChildPsychiatry

IntroductionandOverview,NormalChildDevelopment,NormalAdolescence

Psychiatric Examination of the Infant, Child, and Adolescent.MentalRetardation.

LearningDisorders.

Pervasive Developmental Disorders.Attention-DeficitDisorders.

DisruptiveBehaviorDisorders.

Feeding and Eating Disorders of Infancy and Early Childhood.TicDisorders.

EliminationDisorders.

OtherDisordersofInfancy,Childhood,andAdolescence.MoodDisorders in Children and Adolescents.

Anxiety Disorders in Children.Early-OnsetSchizophrenia.

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UNIT-XIII
ChildPsychiatricTreatment
Individual Psychodynamic Psychotherapy, Short-Term Psychotherapies. Cognitive BehavioralPsychotherapy, Group Psychotherapy, Family Therapy, Pediatric Psychopharmacology, PartialHospitalandAmbulatoryBehavioralHealthServices,ResidentialandInpatientTreatment,Community-BasedTreatment and PsychiatricTreatmentofChildrenandAdolescents, etc.

ChildPsychiatrySpecialAreasofInterest
Psychiatric Aspects of Day Care , Adoption and Foster Care , Child Maltreatment , Children'sReactiontoIllnessandHospitalization,PsychiatricSequelofHIVandAIDS,ChildorAdolescentAntisocialBehavior,DissociativeDisorders,IdentityProblemandBorderlineDisorders,AdolescentSubstanceAbuse,ForensicPsychiatry,EthicalIssues,SchoolConsultation, Prevention of Psychiatric Disorders, Neuroimaging, Child Mental Health ServicesResearch,Impact ofTerrorism on Children etc.
UNIT-XIV
AdulthoodGeriatricPsychiatry

UNIT-XV
HospitalandCommunityPsychiatryPsychiatricEducation
EthicsandForensicPsychiatry
PsychiatryPastandFuture:BehavioralAddiction andMolecularPsychiatry

- **Recent advances and developments in the discipline.**

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13A-PAEDIATRICS

1. **GrowthandDevelopment:**
   1) Principlesofgrowthanddevelopment
   2) Normalgrowthanddevelopmentinchildhoodandadolescence
   3) AssessmentofGestationAge
   4) GrowthPatterns
   5) GrowthCharts
   6) MamtaCard
   7) AssymetricGrowth
   8) SkeletalDysplasia
   9) DevelopmentalDelayanditsassessment
   10) AssessmentofAge
   11) Sexualmaturationandits disturbance
   12) Adolescentproblems
2. **Neonatology:**
   1) Perinatalcare
   2) Careinthelabourroom
   3) Neonatalresuscitation
   4) Prematurity
   5) NormalNewborn

6) HighRiskNewborn
7) CareinHospitalandfollowupafterdischarge
8) NewbornScreening
9) PersistentPulmonaryHypertension
10) OxygenTherapy,HFNCandCPAP
11) NeonatalVentilation
12) Commontransientphenomena
13) LowBirth weightand SGA
14) NewbornfeedingandParenteralNutrition
15) HumanMilkBanking
16) Respiratorydistress
17) Apnea
18) AntenatalRiskFactorsandtheirimpactonFoetalOutcome
19) Antenatal diagnosisandFoetal Therapy
20) Infections
21) NeonatalJaundice
22) Neurologicdisorders
23) ThermoregulationanditsdisordersincludingKangarooMother Care
24) Anemiaandbleedingdisorders
25) Gastrointestinaldisorders
26) CongenitalMalformations
27) InbornErrors ofMetabolismandNewborn screening
28) NeonatalSeizures
29) DevelopmentallySupportive Care
30) Fluidand Electrolyteimbalanceinnewborn
31) AcutelifethreateningeventsandSIDS

3. Nutrition:

1) MaternalHealthanditsimpactonthehealthofchild
2) InfantandYoungChildNutrition
3) MAAProgram
4) ComplementaryFeeding
5) Proteinenergymalnutritionandsevereacutemalnutrition
6) Adolescentnutrition
7) Nutritional management of systemic illness (celiac disease, hepatobiliary disorders, nephriticsyndrome)
8) Nutritionforthelowbirthweight
9) Earlyinitiationandexclusivebreastfeeding
10) VitaminDeficiencydisorders
11) MicronutrientDeficiency
12) Obesityandmetabolicsyndromes
13) Parenteralandenteralnutritioninneonatesandchildren
14) Hyperlipidemiainchildren

4. Cardiovascular:

1) FoetalCirculation
2) AntenataldevelopmentofCVS
3) Congenitalheart diseases(cyanoticandacyanotic)
4) Infectiveendocarditis
5) Diseaseofmyocardium(cardiomyopathy,myocarditis)
6) RheumaticFeverandrheumaticheart disease
7) Arrhythmia
8) Diseasesofpericardium

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9) Systemichypertension
10) Heartfailureanditsmanagement
11) BasicsofECG
12) Echocardiography

5. Respiratory:

1) Congenitalandacquireddisordersofnose
2) Tonsilsandadenoids
3) Congenitalanomaliesofupperandlowerrespiratorytract
4) Foreignbodyinlarynxtrachea&bronchus
5) Neoplasmof larynx and trachea
6) Bronchitis
7) Aspirationpneumonia
8) Acutepneumonia
9) Suppurativelungdisease
10) Atelectasis
11) Emphysemaandhyper-inflation
12) Pulmonaryedema
13) Infectionsofupperrespiratorytract
14) Obstructivesleepapnea
15) Acuteinflammatoryupperairwayobstruction
16) Subglotticstenosis(acuteandchronic)
17) Bronchiolitis
18) GER
19) Recurrentandinterstitialpneumonia
20) Lungcysts
21) Bronchialasthma
22) Bronchiectasis
23) PleuralEffusion
24) Mediastinalmass
25) Pulmonaryleaks
26) CysticFibrosis
27) PulmonaryFunctionTest

6. GastrointestinalandLiverDisease:

1) DiseaseofOral Cavity
2) Disordersofdeglutitionandesophagus
3) H.pyloriinfectionandPepticulcerdisease
4) Malabsorptionsyndromeandceliacdisease
5) IrritableBowelSyndrome
6) Hepatitis
7) Chronicliverdisease
8) Cirrhosisandportalhypertension
9) Pepticulcerdisease
10) Foreignbodyofoesophagusand stomach
11) Intestinalobstruction
12) Acute,Persistentandchronicdiarrhea
13) Inflammatoryboweldisease
14) Hepaticfailure
15) Wilson'sdisease
16) Metabolicdiseasesofliver
17) Livertransplant
18) Proteinlosingenteropathy

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19) Infantilecholestasis
20) Liver abscess
21) PortalHypertension

7. Nephrologic&Urologic Disorders:

1) Acuteandchronicglomerulonephritis
2) Hemolyticuremicsyndrome
3) VURandrenal scarring
4) Renaltubulardisorders
5) Congenital andhereditaryrenaldisorders
6) Posteriorurethralvalves
7) NephroticSyndrome
8) Urinarytractinfection
9) UndescendedTestes
10) Renalinvolvement insystemicdiseases
11) Renalandbladderstones
12) Hydronephrosis,VoidingDysfunction
13) Wilm'sTumor
14) Renaltransplant
15) Acuteandchronicrenal failure
16) PeritonealdialysisHemodialysisandContinuousrenalreplacementtherapy

8. NeurologicDisorders:

1) Seizureandnon-seizureparoxysmal events
2) Meningitis
3) Brainabscess
4) Acuteencephalitisandfebrileencephalopathies
5) Neurocysticercosisandotherneuroinfestation
6) PediatricStroke
7) Neurometabolicandneurodegenerativedisorders
8) Neuromusculardisorders
9) Learningdisabilities
10) AcuteflaccidparalysisandAFPsurveillance
11) Movementdisordersofchildhood
12) Malformations
13) Epilepsyandepilepticsyndromesof childhood
14) Coma
15) GuillainBarreSyndrome
16) Cerebralpalsy
17) Mentalretardation
18) Ataxia
19) CNStumors
20) Traumaticbrain and spinalcordinjury
21) AcquiredacuteandchronicdemyelinatingdisordersofNervoussystem
22) Hydrocephalus
23) Neuroimaging
24) Neuro-electrophysiology(EEG,EMG,Nerveconductionstudy,Evokedpotentials)

9. Hematology&Oncology:

1) Deficiencyanemias
2) Aplasticanemia
3) Thrombocytopenia
4) BloodComponent Therapy
5) Bonemarrowtrasnsplant/stemcelltransplant

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6) Myelodysplasticsyndrome
7) HodgkinandNon-Hodgkin'slymphoma
8) Hypercoagulablestates
9) Hemolyticanemias
10) Pancytopenia
11) Transfusionrelatedinfections
12) Acuteandchronicleukemia
13) Hodgkindisease
14) Neuroblastoma
15) Febrileneutropenia
16) DisordersofHemostasis
17) FlowCytometry
18) Solidtumorsof childhood

10. Endocrinology:

1) Hypopituitarism/hyperpituitarism
2) Pubertaldisorders
3) Adrenalinsufficiency
4) Adrenogenitalsyndromes
5) Hypoglycemia
6) Gonadaldysfunctionandintersexuality
7) Diabetesinsipidus
8) Hypo-andhyper-thyroidism
9) Cushing'sSyndrome
10) Shortstature
11) Obesity
12) DiabetesMellitus

11. Infections:

1) BacterialInfections
2) FungalInfections
3) RickettsialInfections
4) Protozoalandparasitic Infections
5) HIV
6) Controlofepidemicsandinfectionprevention
7) ViralInfections
8) Mycoplasma
9) Tuberculosis
10) Nosocomialinfection
11) Childhoodimmunization
12) Biomedicalwaste

12. Emergency &CriticalCare:

1) Emergencycare of shock
2) Respiratoryfailure
3) Statusepilepticus
4) Fluidandelectrolytedisturbancesanditstherapy
5) Poisoning
6) Scorpionandsnakebites
7) Cardio-respiratoryarrest
8) Acuterenalfailure
9) Acutesevereasthma
10) Acidbasedisturbances
11) Accidents
12) Ventilation(InvasiveandNon-invasive)

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13.Immunology&Rheumatology:

1) Arthritis(acuteandchronic)
2) T and Bcelldisorders
3) Connectivetissuedisorders
4) Immuno-deficiencysyndromes
5) PediatricAutoimmunedisorders

14. ENT:

1) Acuteandchronicotitismedia
2) Post-diphtheriticpalatalpalsy
3) Acute/chronictonsillitis/adenoids
4) Foreign body
5) Conductive/sensorineuralhearingloss
6) Allergicrhinitis/sinusitis
7) Cochlearimplant
8) AssessmentofHearing

15.SkinDiseases:

1) Exanthematousillnesses
2) Pigmentdisorders
3) Pyogenicinfections
4) Steven-johnsonsyndrome
5) Seborrheicdermatitis
6) Urticaria
7) Icthyosis
8) Vascularlesions
9) Vesicobullousdisorders
10) Fungal andparasitic
11) Eczema
12) Drugrash
13) Alopecia

16.EyeProblems:

1) Refractionand accommodation
2) Nightblindness
3) Strabismus
4) Retinopathyofprematurity
5) Opticatrophy
6) Partial/totallossofvisioncataract
7) Chorioretinitis
8) Conjuctivalandcornealdisorders
9) Retinoblastoma
10) Papilledema
11) Cataract
12) Amaurosis

17.Behavioral&Developmental Disorders:

1) Rumination
2) Enuresis
3) Sleepdisorders
4) Breathholdingspells
5) Mooddisorders
6) Attentiondeficithyperactivitydisorders
7) Pica
8) Encopresis
9) Habitdisorders

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10) Anxietydisorders
11) Tempertantrums
12) PervasiveDevelopmentDisordersandAutisticDevelopmentDisorders

18.Social Pediatrics:

1) Nationalhealthprogramsrelatedtochildhealth
2) Childlabor
3) Disabilityandrehabilitation
4) Nationalpolicyofchildhealthandpopulation
5) Childabuse andneglect
6) Adoption
7) Rightsofthechild
8) Juveniledelinquency
9) IMSAct
10) BabyFriendlyHospitalInitiative
11) Breast FeedingPolicy
12) ICDS

19.Genetics:

1) Principlesofinheritance
2) Chromosomaldisorders
3) Multifactorial/polygenicdisorders
4) Prenatal diagnosis
5) Pedigreedrawing
6) Singlegenedisorders
7) Geneticdiagnosis
8) Moleculargenetics

20.Orthopedics:

1) Majorcongenitalorthopedicdeformities
2) Boneandjointinfections: PyogenicandTubercular
3) Rickets
4) Commonbonetumors

- **Recent advances and developments in the discipline.**

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13B-CHILD PSYCHOLOGIST

(PsychosocialFoundationsofBehavior)

Unit - I: Introduction: Overview of the profession and practice; history and growth;professional role and functions; current issues and trends; areas of specialization;ethical andlegal issues;code ofconduct.

Unit - II: Mental health and illness: Mental health care – past and present; stigmaandattitudetowardsmentalillness;conceptofmentalhealthandillness;perspectives – psychodynamic, behavioral, cognitive, humanistic, existential

andbiologicalmodelsof mental health/illness;

Unit - III: Epidemiology: Studies in Indian context; tools available/standardized forepidemiological surveys; socio-cultural correlates of mental illness; religion andmental health; psychological well-being and quality of life – measures and factorsinfluencing.

Unit - IV: Self and relationships: Self-concept, self-image, self-perception and self-regulationsinmentalhealthandillness;learnedhelplessnessandattributiontheories; social skill model; interpersonal and communication models of mentalillness;stressdiathesismodel,resilience,copingandsocialsupport.

Unit - V: Family influences: Early deprivation and trauma; neglect and abuse;attachment; separation; inadequate parenting styles; marital discord and divorce;maladaptivepeerrelationships;communicationstyle;familyburden;emotionala daptation; expressedemotionsandrelapse.

Unit - VI: Societal influences: Discrimination in race, gender and ethnicity; socialclassandstructure,povertyandunemployment;prejudice,socialchangeand uncertainty; crime and delinquency; social tension & violence; urban stressors;torture & terrorism; culture shock; migration; religion & gender related issues withreferencetoIndia.

Unit-VII:Disability:Definitionandclassificationofdisability;psychosocialmodelsofdisability;impact,needsandproblems;issuesrelatedtoassessment/certificationof disability–areasandmeasures.

Unit-VIII:Rehabilitation:Approachestorehabilitation;interventionsintherehabilitation processes; models of adaptation to disability; family and caregiversissues;rightsofmentallyill;empowermentissues; supporttorecovery.

Unit-IX:PoliciesandActs:RehabilitationPoliciesandActs;assistance,concessions,socialbenefitsandsupportfromgovernmentandvoluntaryorganizations; contemporary challenges; rehabilitation ethics and professional codeofconduct.

Part–B(Psychopathology)

Unit - X: Introduction to psychopathology: Definition; concepts of normality andabnormality;clinicalcriteriaofabnormality;continuity(dimensional)versusdiscontinuity(categorical),andprototypemodelsofpsychopathology;classificationandtaxonomies–reliabilityandutility;classificatorysystems,currentlyinuseandtheir

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advantagesandlimitations.

Unit-XI:Signsandsymptoms:Disordersofconsciousness,attention,motorbehavior, orientation, experience of self, speech, thought, perception, emotion, andmemory.

Unit-XII:Psychologicaltheories:Psychodynamic;behavioral;cognitive;humanistic; interpersonal; psychosocial; and other prominent theories/models ofprincipalclinicaldisordersandproblems,viz.anxiety,obsessive-compulsive,somatoform,dissociative,adjustment,sexual,substanceuse,personality,suicide, childhoodandadolescence,psychotic,mooddisorders,andculture-specificdisorders.

Unit - XIII: Indian thoughts: Concept of mental health and illness; nosology andtaxonomyofmentalillness;socialidentityandstratification(VarnashramaVyawastha); concept of – cognition,emotion, personality,motivation and theirdisorders.

BiologicalFoundationsofBehavior:

Part –A(Anatomy,PhysiologyandBiochemistryofCNS)

Unit–I:Anatomyofthebrain:Majoranatomicalsub-divisionsofthehumanbrain;thesurfaceanatomyandinteriorstructuresofcorticalandsub-corticalregions; anatomical connectivity among the various regions; blood supply to brainandtheCSFsystem;cytoarchitectureandmodularorganizationinthe brain.

Unit – II: Structure and functions of cells: Cells of the nervous system (neurons,supporting cells, blood-brain barrier); communication within a neuron (membranepotential,actionpotential);communicationbetweenneurons(neurotransmitters,neuromodulatorsandhormones).

Unit – III: Biochemistry of the brain: Biochemical and metabolic aspects of Brain;medical genetics; structure and function of chromosomes; molecular methods ingenetics;geneticvariation;populationgenetics;single-geneinheritance;cytogeneticabnormalities;multifactorialinheritance;biochemistryofgeneticdiseases.

Unit – IV: Neurobiology of sensory and motor systems: Organization of sensorysystem in terms of receptors, relay neurons, thalamus and cortical processing ofdifferentsensations;principlemotormechanismsoftheperiphery(musclespindle),thalamus,basalganglia,brainstem,cerebellum andcerebralcortex.

Unit – V: Regulation of internal environment: Role of limbic, autonomic and theneuroendocrine systeminregulating theinternalenvironment;

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reticular formation and other important neural substrates regulating the state ofsleep/wakefulness.

Unit–VI:Neurobiologyofbehavior:Neurobiologicalaspectsofdrives,motivation,hunger,thirst,sex,emotions,learning andmemory;

Unit–VII:Psychopharmacology:Principlesofpsychopharmacology(pharmacokinetics, drug effectiveness, effect of repeated administration); sites ofdrugaction(effectsonproduction,storage,release,receptors,reuptakeanddestruction); neurotransmitters and neuromodulators (acetylcholine, monoamines,aminoacids, peptides,lipids).

Part–B(Neuropsychology)

Unit - VIII: Introduction: Relationship between structure and function of the brain;the rise of neuropsychology as a distinct discipline, logic of cerebral organization;localizationandlateralizationoffunctions;approachesandmethodologies ofclinical andcognitiveneuropsycholoigsts.

Unit- IX: Frontal lobe syndrome: Disturbances of regulatory functions; attentionalprocesses;emotions;memoryandintellectualactivity;languageandmotorfunctions.

Unit-X:Temporallobesyndrome:Specialsenses–hearing,vestibularfunctionsandintegrativefunctions;disturbancesinlearningandmemoryfunctions;language,emotions,timeperception andconsciousness.

Unit – XI: Parietal and occipital lobe syndromes: Disturbances in sensory functionsand body schema perception; agnosias and apraxias; disturbances in visual spaceperception; colorperception; writingandreadingability.

Unit–XII: Neuropsychologicalprofile of variousneurologicaland psychiatricconditions:Huntington'sdisease,Parkinson'sdisease,progressivesupranuclear palsy, thalamic degenerative disease, multiple sclerosis, cortical and subcorticaldementias,Alzheimer'sdementia,AIDSdementiacomplexetc.,andprincipalpsychiatricsyndromessuchaspsychosis,mooddisorders,suicide,anxietydisorders,and otheremotionalandbehavioralsyndromes.

Unit – XIII: Functional human brain mapping: QEEG, EP & ERP, PET, SPECT,fMRI

Unit – XIV: Neuropsychological assessment: Introduction, principles, relevance,scope and indications for neuropsychological assessment and issues involved inneuropsychological assessment of children.

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Unit–XV:Neuropsychologicalrehabilitation:Principles,objectivesandmethodsofneuro-rehabilitationoftraumaticbraininjuryandbraindiseased;scopeofcomputer-basedretraining,neurofeedback,cognitiveaidsetc.

Psychiatry:

Unit-I:Introduction:Approachtoclinicalinterviewinganddiagnosis;casehistory; mental status examination; organization and presentation of psychiatricinformation;diagnosticformulation;classificatorysystemin use.

Unit - II: Psychoses: Schizophrenia, affective disorders, delusional disorders andotherformsofpsychoticdisorders–types,clinicalfeatures,etiologyandmanagement.

Unit-III:Neurotic,stress-relatedandsomatoformdisorders:types,clinicalfeatures,etiologyandmanagement.

Unit - IV: Disorders of personality and behavior: Specific personality disorders;mental&behavioraldisordersduetopsychoactivesubstanceuse;habitandimpulsedisorders;sexualdisordersanddysfunctions–types,clinicalfeatures,etiologyandmanagement.

Unit-V:Organicmentaldisorders:Dementia,deliriumandotherrelatedconditions with neuralgic and systemic disorders – types, clinical features, etiologyandmanagement.

Unit - VI: Behavioral, emotional and developmental disorders of childhood andadolescence: types,clinicalfeatures,etiologyandmanagement.

Unit-VII:Mentalretardation:Classification,etiologyandmanagement.

Unit-VIII:Neurobiologyofmentaldisorders:Neurobiologicaltheoriesofpsychosis, mood disorders, suicide, anxiety disorders, substance use disorders andotheremotionaland behavioral syndromes.

Unit-IX: Therapeutic approaches:Drugs,ECT,psychosurgery,psychotherapy,and behavior therapy, preventive and rehabilitative strategies – half-way home,shelteredworkshop,daycare,andinstitutionalization.

Unit-X:Consultation-liaisonpsychiatry:Psychiatricconsultationingeneralhospital; primarycaresetting.

PsychotherapyAndCounseling:

Unit - I: Introduction to Psychotherapy: Definitions, objectives, issues related totraining professional therapists; ethical and legal issues involved in therapy work;rights andresponsibilities inpsychotherapy; issues related to consent (assent incase of minors); planning and recording of therapy sessions; structuring and

settinggoals;pre- andpost-assessment;practiceofevidence-basedtherapies.

Unit- II: Therapeutic Relationship: Client and therapist characteristics; illness,techniqueandotherfactorsinfluencingtherelationship.

Unit - III: Interviewing: Objectives of interview, interviewing techniques, types ofinterview,characteristicsofstructuredandunstructuredinterview,interviewingskills (micro skills), open-ended questions, clarification, reflection, facilitation andconfrontation,silencesininterviews,verbalandnon-verbalcomponents.

Unit-

IV:Affectivepsychotherapies:Origin,basis,formulation,procedures,techniques,stages ,process,outcome, indications, and research & current statuswithrespecttopsychodynamic,briefpsychotherapy,humanistic,existential,gest alt,person-

centered,Adlerian,transactionalanalysis,realitytherapy,supportive,clinicalhypnother apy,playtherapy,psychodrama,andorientalapproachessuchas

yoga,meditation,shavasana,pranic healing,reiki,taichietc.

Unit – V: Behavior therapies: Origin, foundations, principles & methodologies,problems and criticisms, empirical status, behavioral assessment, formulations andtreatmentgoals,Desensitization-(imaginal,in-vivo,enriched,assisted),Extinction

- (graded exposure, flooding and response prevention, implosion, covert extinction,negativepractice,stimulussatiation),Skilltraining-

(assertivenesstraining,modeling,behavioralrehearsal),Operantprocedures-

(tokeneconomy,contingencymanagement),Aversion-

(faradicaversiontherapy,covertsensitization,aversionreliefprocedure,anxietyreliefpr ocedureandavoidanceconditioning),Self-controlprocedures-

(thoughtstop,paradoxicalintention, stimulus satiation), Biofeedback – (EMG, GSR, EEG, Temp., EKG), Behavioralcounseling,Group behavioralapproaches,Behavioralfamily/maritaltherapies.

Unit-

VI:Cognitivetherapies:Cognitivemodel,principlesandassumptions,techniques,indicati ons and current status of rational emotive behavior therapy,cognitivebehaviortherapy,cognitiveanalytictherapy,dialecticalbehaviorthera py, problem-solvingtherapy,mindfulness based cognitive therapy, schemafocused therapy, cognitive restructuring, and other principal models of cognitivetherapies.

Unit–

VII:Systemictherapies:Origin,theoreticalmodels,formulation,procedures,techniques,

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stages,process,outcome,indications,andresearch&current status with respect to family therapy, marital therapy, group therapy, sextherapy,interpersonaltherapyand otherprominent therapies.

Unit–VIII:Physiologicaltherapies:Origin,basis,formulation,procedures,techniques, stages, process, outcome, indications, and current status with respect toprogressive muscular relaxation, autogenic training, biofeedback, eye-movementdesensitizationandreprocessing,andotherformsofevidence-basedtherapies.

Unit – IX: Counseling: Definition and goals, techniques, behavioral, cognitive and xhumanisticapproaches,process,counselingtheoryandprocedurestospecificdomainsof counseling.

Unit-X:Therapyinspecialconditions:Therapiesandtechniquesinthemanagementofdeliberate selfharm,bereavement,traumatic,victimsofman-madeornaturaldisasters,incrisis,personalitydisorders,chronicmentalillness,substance use,HIV/AIDS,learningdisabilities,mentalretardation,andsuchotherconditionswherein tegrative/eclecticapproachisthebasisofclinicalintervention.Unit-XI:Therapywith children:Introductionto differentapproaches,psychoanalytictherapies(AnaFreud,MelanieKlein,DonaldWinnicott);specialtechniques(behavioralandplay)fordevelopmentalinternalizingandexternalizing disorders; therapy in special conditions such as psycho-physiological and chronicphysicalillness;parentandfamilycounseling; therapy withadolescents.

Unit – XII: Psychoeducation (therapeutic education): Information and emotionalsupportforfamilymembersandcaregivers,modelsoftherapeuticeducation,family counseling for a collaborative effort towards recovery, relapse-preventionandsuccessfulrehabilitationwithregardtovariousdebilitatingmentaldisorders.

Unit–XIII:Psychosocialrehabilitation:Rehabilitationservices,resources,medicalandpsychosocialaspectsofdisability,assessment,grouptherapy,supportive therapy and other forms of empirically supported psychotherapies forcore andperipheralmembers.

Unit-XIV:PsychotherapyintheIndianContext:Historicalperspectiveinpsychologicalhealingpracticesfromthe Vedicperiodandthesystemsof Ayurveda and Yoga, contemporary perspectives; socio-cultural issues in the

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Indiancontextinpracticeofpsychotherapy;ongoingresearchrelatedtoprocessandoutcome.

Unit-XV:Contemporaryissuesandresearch:Issuesrelatedevidence-basedpractice,managedcare,andresearch related toprocessand outcome.

Behavioral Medicine:

Unit–I:Introduction:Definition,boundary,psychologicalandbehavioralinfluencesonhealthandillness,neuroendocrine,neurotransmitterandneuroimmuneresponsestostress,negativeaffectivity,behavioralpatterns,andcoping styles, psychophysiological models of disease, theoretical models of healthbehavior, scope and application of psychological principles in health, illness andhealthcare.

Unit – II: Central nervous system: Cognitive, personality, behavioral, emotionaldisturbancesinmajorCNSdiseaseslikecerebrovascular(stroke,vascular dementiaetc.),developmental(cerebralpalsy),degenerative(Parkinson'setc.),trauma(traumaticbrainandspinalcordinjury),convulsive(epilepsy),andinfectious(AIDSdementia),assessmentandmethodsforpsychologicalinterventionandrehabilitationwithsuch patients.

Unit – III: Cardiovascular system: Psychosocial, personality, lifestyle, and healthpracticeissues,psychobehavioralresponsesincludingcopingwithillnessandfunctional lossin hypertension,MI,following CABG and other cardiovascularconditions, salient issues with regard to quality-of-life and well-being, empiricallyprovenmethodsofpsychologicalmanagementof CVSdiseases.

Unit – IV: Respiratory system: precipitants, such as emotional arousal, and otherexternal stimuli, exacerbants such as anxiety and panic symptoms, effects, such assecondarygain,lowself-esteeminasthmaandotherairwaydiseases,psychological,behavioralandbiofeedbackstrategiesasadjunctinthemanagement.

Unit – V: Gastrointestinal system: Evaluation of psychological factors includingpersonalitycharacteristicsandstress/copingstyleinfunctionalGIdisorderssuch as irritable bowelsyndrome,inflammatorybowel disease, pepticulcerdisease,esophageal disorder etc., role of psychotherapy, behavior modification, cognitiverestructuring,biofeedbackand relaxationtraining.

Unit–VI:Genitourinary/renal/reproductivesystem:Psychosocialissuesinmale/femalesexual

dysfunctions,micturition/voidingproblemsincludingprimary/secondaryenuresis,end-stagerenal disease, dialysis treatment, primaryandsecondaryinfertility,empiricallyvalidatedpsychologicalandbehavioralinterventionsinthese conditions.

Unit–VII:Dermatology:Roleofstressandanxietyinpsychodermatologicalconditionssuchaspsoriasis,chronicurticaria,dermatitis,alopeciaandtheimpact of these on self-esteem, body image and mood, role of psychological interventionssuchas relaxation,stressmanagement,counselingandbiofeedbackstrategies.

Unit – VIII: Oncology: Psychosocial issues associated with cancer - quality of life,denial,griefreactiontobodilychanges,fearoftreatment,sideeffects,abandonment,recurrence,resilience,assessmenttools,andgoalsofinterventionsforindividual andfamily,andtherapy techniques.

Unit–IX:HIV/AIDS:Modelof HIV disease service program inIndia,pre- andpost-test counseling, psychosocial issuesandtheirresolutionsduring HIVprogress,psychologicalassessmentandinterventionsininfectedadultsandchildren,andfamilymembers/caregivers,highlyactiveanti-retroviraltreatments(HAART),neuropsychologicalfindingsatdifferentstagesofinfection,issuesrelatedtoprevention/spreadingawarenessandinterventionsinatriskpopulations.Unit–X:Pain:Physiologicalandpsychologicalprocessesinvolvedinpainexperienceandbehavior,assessmenttoolsforacuteandchronicpainintensity,behavior,anddysfunctions/disabilityrelatedtopain,psychologicalinterventionssuchascognitive,behavioral,biofeedbackand hypnotictherapies.

Unit – XI: Terminally ill: Medical, religious and spiritual definition of death anddying, psychology of dying and bereaved family, strategies of breaking bad news,bereavementandgriefcounseling,managementofpainandotherphysicalsymptoms associated with end-of-life distress in patients with cancer, AIDS, andother terminal illness, professional issues related to working in hospice includingworking through one's own death anxiety, euthanasia – types, arguments for andagainst.

Unit–XII:Othergeneralclinicalconditions:Applicationofpsychologicaltechniques and their rationale in the clinical care of patients in general medicalsettings where psychological services appears to affect the outcome of medicalmanagementpositively,forexampleindiabetes,sleepdisorders,obesity,dental anxiety,burnsinjury,pre-andpost-

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surgery,preparingforamputation,evaluationoforgandonors/recipient,pre-andpost-transplantation,organreplacement,hemophiliacs, sensory impairment, rheumatic diseases, abnormal illness behavior,healthanxietyetc.

Unit–XIII:ContemporaryIssues:Researchanddevelopmentsinhealthpsychology,psychophysiology,psychoneuroimmunology,psychobiology,sociobiology and their implications, and effects of psychotherapy on the biology ofbrain.

Statistics

Unit - I: Introduction: Various methods to ascertain knowledge, scientific methodanditsfeatures;problemsinmeasurementinbehavioralsciences;levelsofmeasurementofpsychologicalvariables-nominal,ordinal,intervalandratioscales;testconstruction-itemanalysis,conceptandmethodsofestablishingreliability,validityandnorms.

Unit-II:Sampling:Probabilityandnon-probability;variousmethodsofsampling - simple random, stratified, systematic, cluster and multistage sampling; samplingandnon-samplingerrorsandmethodsof minimizingtheseerrors.

Unit-III:Conceptofprobability:Probabilitydistribution-normal,poisson,binomial;descriptivestatistics-centraltendency,dispersion,skewnessandkurtosis.

Unit - IV: Hypothesis testing: Formulation and types; null hypothesis, alternatehypothesis, type I and type II errors, level of significance, power of the test, p-value.Conceptof standarderrorandconfidenceinterval.

Unit - V: Tests of significance - Parametric tests: Requirements, "t" test, normal z-test,and"F"testincludingpost-hoctests,one-wayandtwo-wayanalysisof variance, analysis of covariance, repeated measures analysis of variance, simplelinearcorrelationandregression.

Unit – VI: Tests of significance - Non-parametric tests: Requirements, one-sampletests–signtest,signranktest,mediantest,McNemertest;two-sampletest–Mann Whitney U test, Wilcoxon rank sum test, Kolmogorov-Smirnov test, normalscorestest,chi-square test;k-sample tests -KruskalWallies test,andFriedmantest,Andersondarlingtest,Cramer-vonMisestest.

Unit-VII:Experimentaldesign:Randomization,replication,completelyrandomized design, randomized block design, factorial design, crossover design,single subject

design,non-experimentaldesign.

Unit-VIII: Epidemiologicalstudies:Prospective andretrospectivestudies,casecontrol and cohort studies,rates,sensitivity,specificity,predictive values,Kappastatistics,oddsratio,relativerisk,populationattributablerisk,MantelHaenzeltest,prevalence,andincidence.Agespecific,diseasespecificandadjustedrates,standardizationofrates.Testsofassociation,2x2androwxcolumncontingencytables.

Unit-IX:Multivariateanalysis:Introduction,Multipleregression,logisticregression, factor analysis, cluster analysis, discriminant function analysis, pathanalysis,MANOVA,Canonicalcorrelation,andMultidimensionalscaling.

Unit- X: Sample size estimation: Sample size determination forestimation ofmean,estimationofproportion,comparingtwomeansandcomparingtwoproportions.

Unit - XI: Qualitative analysis of data: Content analysis, qualitative methods ofpsychosocial research.

Unit - XII: Use of computers: Use of relevant statistical package in the field ofbehavioralscience andtheirlimitations.

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14-GENERALSURGERY

A. **SurgicalAnatomy**

1. **Head&Neck**-PartsofBrainincludingventricles&intracranialvascular arrangement,Spinothalamic tracts. Anatomy of great vessels of neck. Neck triangles, Anatomy of Trachea,Parotidgland,Anatomy andrelationsandfacialnerve.Anatomicaldistributionofcervicallymphnodes.
2. **Thyroidgland**-Anatomy ofThyroidgland&parathyroidglandandCourseofrecurrentLaryngealNerve.
3. **Breast**-Anatomyofbreast,Lymphaticdrainageofbreastandarrangementofaxillarylymphnodes.
4. **Chest-**AnatomyofChestwall,lungs,pleura,Heart&greatvessels,Courseofoesophagusanditsrelations with aorta and azygus veinand Thoracic duct.
5. **Stomach -**Bloodsupply&lymphaticdrainage,courseofvagusnerve.
6. **Duodenum**-Peritonealreflections &relationshipwithheadofPancreas.
7. **SmallIntestine**-Malrotation,vitellointestinalduct,urachus andMeckle's diverticulum.
8. **LargeIntestine**-Appendix-Variouspositionsanditsclinicalrelevance,peritonealreflections,vascularsupply and lymphaticdrainageof largeintestine.

9. **Rectumandanus**-Peritonealreflections,Vascular&Lymphaticarrangement,analmembrane,Hilton'slines andrelationships withperineal musclesand developmentalanomalies.
10. **Liver**-Anatomicalandsurgicallobesofliver,vascularsupplyandintrahepaticductalarrangement.
11. **GallBladder**-Anatomicalvariationsofthecysticductandcysticartery(Inrelationtohepaticartery), anatomyofextra hepaticbilliarysystem.
12. **Pancreas**-Relationwithportalvein,inferiormesentericveinandIVC,Boundriesoflessersac.
13. **Spleen**-Vascularsupplyanditsrelationwithtailofpancreas,Colon,Kidney,Diaphragm,stomach.
14. **Diaphragm**-Development, varioushaitus&relationship withstructurespassing throughthem.
15. **RetroperitonealArea**-Lymphatic,Thoracicduct,lymphnodes,sympatheticschain-andanatomyof great vessels.
16. **KidneyandUreters** -Developmentalanomalies,Bloodsupply,Courseof Ureter.
17. **Suprarenal**-Bloodsupply,venousdrainageandrelationswithkidney.
18. **UrinaryBladder&Prostate**-Anatomy& relationswithrectum andUreter.
19. **Urethra-** Length,Variouspartsanddevelopmentanomalies.
20. **Penis**- Lymphaticdrainage-Attachmentofcrura.
21. **Testis**-Developmentanomalies likeUDT,MDT,etc.
22. **Extremities**-Upperlimb-Variousmusculercompartmentsofhand,forearm&arm.Courseofvariousvessels&nerves,e.g. radial, median&ulnar.
    Lowerlimb-Arterialsupply&venousdrainageoflowerlimb,musculercompartmentoffoot,leg&thigh.(As per Head Department of Surgery this point may be included in the syllabus of Orthopedics instead of General Surgery)
23. **SurgicalAnatomy**ofinguinalCanal**,**Femoralcanal,umbilicus&abdominalwall &itsanatomy,various abdominal surgical incisions.

B. SurgicalPhysiology

1. **Thyroid**- IodineMetabolism,Pituitary-ThyroidHormoneaxis.
2. **Breast**-Effectsofvarioushormonesonbreast.
3. **Chest**-Mechanismofrespiration,effectonHemodynamics,Cardiaccirculation,surgicalcausesofhypertension.
4. **Stomach**-Mechanismofacidproduction.
5. **Intestine**-Secretoryandabsorptivemechanism ofsmalland largeintestine.
6. **RectumandAnus** -Mechanismofdefecation.
7. **Liver**-MechanismofBilesecretion,Entero-hepaticcirculationandvariousmetabolicfunctionsofliver.
8. **GallBladder**-Mechanismofgallstone formation.
9. **Pancreas**-ExocrineandEndocrinepancreaticsecretion,Patho-physiologyofpancreatitis.
10. **Spleen**-Functionsofspleen.

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11. **Diaphragm**-Gastro-oesophagealreflux.
12. **Kidney**-Mechanismofformationofurineinrelationtoacuteandchronic renalfailure.
13. **Suprarenal** -Physiologyofvarioushormoneproduction.
14. **UrinaryBladder**-Mechanismof micturitionandvesico-uretricreflux.
15. **Testis**-Germinaland endocrinalfunctionsoftestis.
16. **CriticalCare**

- Physiologicalresponsetotrauma.
- Nutritioninsurgical criticallyillpatients.
- EnteralandParenteralnutrition.
- Shock.
- Burns.
- Bloodtransfusion.
- FluidandElectrolyteBalance. Acid-BaseBalance.
- ARDS,SIRS,multipleorganfailure.
- Physiologyofwoundhealing.
- Mechanismofclotting.
- Abdominalcompartmentsyndrome.

C. SurgicalPathology

1. Varioustypesofbiopsies,preservationofspecimens.
2. FormationofTumors,Welldifferentiatedcells,Totipotentcells,Histopathological featuresofNeoplasm.Stem cell therapy.
3. Benignand malignanttumors, GenetherapyandTumor Markers.
4. Grading&Stagingoftumors.
5. Disturbedwoundhealing,Necrotising-fascitis,Gangreneandsequestrum.
6. Pathologyof BenignTumorlikeLipoma,Fibroma, Osteoma, Adenoma,Papilloma, etc.
7. Variousprimarymalignant tumor and secondarytumors.

D. ClinicalSurgicalProblems

(Variousclinicalpresentations,diagnosis,complications&treatment)

1. **Head&Neck**-
   Hydrocephalus,Meningocele,Encephalocle,intracranialinjury(contusion,concussion, laceration, extradural and subdural hemorrhage, Middle meningeal hemorrhage, Lucidinterval), cervical spinefracture, Brain tumors in general.CleftLip, Cleft palate, thyroglossalCyst,BranchialCyst,BranchialfistulaandPharyngealpouch,Lymphnodeenlargement-Inflammatory, Tubercular and malignant. Indications/contraindications of lymph node biopsy inneck,Diseases of Salivaryglandsand diseasesoflymphatic system.
2. **Thyroid** - Various types of thyroditis, thyrotoxicosis, myxoedema, cretinism, solitary thyroidnodule, goiters-simple and multi nodular goiter, thyroid malignancy controversies in managementofcarcinomaof thyroid.
3. **Parathyroid**-Adenoma, hyperparathyroidismandmalignancy,MEN.
   Breast – Investigation ofbreast, ANDI, duct ectasia, galactocoele, peurperal abscess, congenitaldisorders, fatnecrosis,acute &subacuteinflammationof breast,abnormaldischargesfromnipple, tuberculosis,actinomycosis,mondor'sdisease,phyllodestumours,carcinomaofbreast(pathology, etiological factors, staging, clinical presentation, treatment which includes surgical,radiotherapy,systemictherapy,hormonaltherapy&itshouldincluderecenttrendsinmanagement.Gynaecomastia, carcinomamalebreast, lipoma,sarcoma, metastases.

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4. **Chest** - Fracture ribs, Flail chest, Haemo-pneumothorax, Lungs injuries, Injures to great vessels,Surgical emphysema, Cardiac tamponade, Tension pneumothorax, pleural effusion, Empyema,Apicalshadowin lungs,Bronchogeniccarcinomaand secondaries ofthelungs.
5. **Oesophgus**– Corrosivestrictures,malignancyoesophgus,Boerhaave'ssyndrome.VaricealBleeding.
6. **Stomach** - Hypertrophic pyloric stenosis, peptic ulcer & perforation, Gastric outlet obstruction,Benign & malignant tumor of stomach, Zollinger - Ellison syndrome Type I & II, H-Pylori-role inAPD&Carcinomastomach. Upper GIBleeding.
7. **Intestine**- Intestinal atresia, exomphalous major, patent vitello - intestinal duct & various clinicalmanifestations, Meckle's diverticulum, Intestinal obstruction, small gut tumors, Tuberculosis ofintestine, caecum and large intestine, malignancy of Caecum and Large intestine, Ulcerative colitis& Crohn's disease, surgical management, Short gut syndrome, intussception, Gastrojejunal bypass,Bariatricsurgery&metabolicsurgery,familialadenomatouspolyposis.LowerGIBleeding,Mesentericischaemia, intestinal failureand intestinal transplantation.
8. **Rectum & Anus** - Imperforated Anus, Hirschsprung's diseases, Piles, fistula in ano, fissure in ano,polyp and adenomas, Ano rectal carcinoma with Special reference to modern management, Lowanteriorresection, valueofcircular staplers.
9. **Liver** - Liver injuries, Liver abscess, Hydatid disease, Hepatic Tumors-Benign and malignant,secondaries,Portal Hypertension, liver resectionandHepatictransplantation.
10. **GallBladder**- Gallstones,acuteandchroniccholecystitis,ComplicationsofGallStones,malignancyof gall bladder, Post operativebileleaks.
11. **Common bile duct** – Bilioma, Haemobilia, Biliary structures, cholangitis, cholangio-carcinoma,obstructivejaundiceandperi ampularycarcinoma.
12. **Pancreas -** Pancreatic injury, acute and chronic pancreatitis (Recent Management), Endocrine,Tumours of Pancreas, Recent Pathogenesis of acute pancreatitis, cysts of pancreas, malignancy ofpancreasandpancreatictransplantation.
13. **Spleen** – Splenic abscess, Hyper splenism, splenic injury, splenomegaly, tumors of spleen, portalhypertension and splenic auto transplantation, Splenorrhaphy. Opportunistics post- splenectomyinfections(OPSI).
14. **Diaphragm**- Diaphragmatichernia,Eventration,diaphragmaticinjuries,Penetratingthoracoabdominalinjuries.
15. **Retroperitoneal tumors -** ratroperitoneal fibrosis, peritonitis, intraabdonominal abscess, burstabdomen,mesentericcyst,pseudomyxomaperitonei,peritonealneoplasm, acutemesentericlymphadenites.
16. **Kidney**– Congentalanomalies,renaltrauma,renalstone,hydronephrosis,pyonephrosis,perinephric abscess, tuberculosis of the kidney, renal tumors and para-malignant Apudomas Renaltransplantation&DonorNephrectomy.
17. **Ureter**- Uretericstones&ureterictransplantation,PUJobstructionsUretericinjury,URS(Ur

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etoro-Reno-Scopy).

18. **Suprarenal** – Phaeochromocytoma, Incidentaloma, Adrenocortical Carcinoma,Neuroblastomaandits surgical management.
19. **Urinary bladder & Prostate** - Exostrophy bladder, posterior uretheral valves, Bladder injury,stones,hematuria,cystitis,Tuberculosis,diverticulum,Benign&malignant tumors,acute&chronicprostatitis,BHP,malignancyofprostate,retention ofurine,incontinenceandurgency.
20. **Urethra**-Urethralinjuries,stricture,stoneandhypospadisis,epispadisis.
21. **Penis**- Phimosis, meatalstenosis,paraphimosis,balanitis,ulcers andmalignancy,Priaprism,Erectiledysfunctions.
22. **Testis** - Undescended testis, Ectopic testis, Acute Orchitis, Chronic epididymo-orchitis, Torsiontestis, Hydrocele, Varicocele, Hematocele and Tumors of the testis, Recent trends in managementoftesticulartumors.
23. **UpperExtremities**- Softtissueinjuriesincludingnerve,muscles,vessels,cervicalribandRaynaud'sdisease.
24. **Skin**- Ulcers,Tumors,S.C.C.,B.C.C.,Sarcoma&Melenoma,kaposi'ssarcoma.Woundmanagement.
25. **Lower Limb** - Varicose veins, DVT, Soft tissue injury, muscles, vessels, nerves & Peripheralvasculardisease, compartmentsyndrome, Endoscopic ligationof subfacialperforators.
26. **Hernia** - Definition, classification, Internal hernia (diaphragmatic, paraduodenal, transmesenteric,Externalhernia(inguinal,femoralepigastic,umbilical,paraumbilicalandincisional),Laparoscopicanatomyofinguinal region.
27. **General-**
    (a) Trauma– polytrauma, resuscitation, Triage.
    (b) Radiotherapy&Chemotherapy&immunotherapyandTumorMarkersforvariousmalignancies.
    (c) Laparoscopicsurgery-Basic & advanced.
    (d) Roboticsurgery&Tele-surgery.
    (e) Anaesthesia-Endotrachealintubation,Tracheostomy,Cardicarrest,Resuscitation&Deathontable,Epidural, Spinal anaesthesia.
    (f) OperationTheatre-Theatresafety,designandlayout.Techniquesincludingautoclave&sterilization,Plasmasterilization.
    (g) Infectivesurgicaldiseases-Gangrene,Tetanus,Necrotisingfascitis,Diabeticfoot,Carbuncleetc.,surgical site infection–types, preventions & useof antibiotics.
    (h) AIDS,universalprecautions.
    (i) Diagnosticprocedures-IVP,Bariumstudies,MRI,CT-Scan,PETScan,Virtualendoscopy,Dopplar,USG.
    (j) Endoscopicprocedures-likeGastroscopy,ERCP,Oesophagoscopy,Colonoscopy&capsuleendoscopy,cystoscopy&uretriccatheterization.
    (k) NOTES–(naturalorificetransabdominalendosurgery)
    (l) Recentadvances in surgerylatest atthetime of examination &interview.
    (m) Fundamentalsofplasticsurgery,neurosurgery,urology,pediatricsurgery,gastro-intestinalsurgery,etc.

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(n) Variousoperativeprocedures.
(o) Biomedicalwastemanagement.
(p) Lasersinsurgery.
(q) SurgicalAudit.
(r) Evidencebasedsurgery.
(s) Daycaresurgery.
(t) Researchmethodology.
(u) Typesofteaching.

- **Recent advances and developments in the discipline.**

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15-ORTHOPAEDICS

UnitI
Applied andBasicMedical SciencesincludingAnatomy, Physiology, Biochemistry,Pharmacology,Pathologyand Microbiologyin relation to orthopaedics.

UnitII
BONE & JOINT- Infections (Pyogenic, Tuberculosis, Syphilis,Mycotic,Salmonella,Brucella,HIV&Viraletc.)

Unit III
Congenital anomalies and developmental deformities, their diagnosis and management inOrthopaedics.

Unit IV
TRAUMATOLOGY ingeneralandin referencetoLocomotorsystem. Principles ofTreatmentin
Trauma. PeripheralNerveInjuries. Principlesof Ilizarov and its application.
UnitV
Diseases,anomaliesandinjuriesofspine.

UnitVI
Metabolic BoneDisorders. Autoimmune BoneandJointDisorderslike RheumatoidArthritis,AnkylosingSpondylitis,Fluorosis,etc.

UnitVII
BoneTumoursinorthopaedics.Recenttrendsinlimbsalvage,chemoandradiotherapy.

UnitVIII
Amputations&DisarticulationsthroughBones&JointsofLimbs.

Unit IX
DegenerativedisordersoftheExtremitieslikeOsteoarthritisofHip&KneeJointsand

Spine(DiagnosisandManagement).

UnitX

Recent Advances : Arthroscopic Surgery, Joint Replacement, Spine Surgery, CT Scan,MRI, Bone Scan, PET Scan, Bone Bank.Role of stem cells in orthopaedics. Minimalinvasivetechniquein orthopaedics.Microscopicsurgeryin orthopaedics.

UnitXI

Physical Medicine and Rehabilitation including occupational Therapy, Electro-diagnosis,Electromyography.Totalconceptof ProsthesisandOrthoticsPhysicaldisabilityassessment.

UnitXII

Disastermanagement.Polytraumamangement.

- **Recent advances and developments in the discipline.**

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16-OTO- RHINO- LARYNGOLOGY (ENT)

Applied Embryology and Applied Anatomy of Nose and paranasal sinuses, mandible, Ear, Vestibularsystem, Temporal bone, Oral cavity, Pharynx, Larynx, tracheobronchial tree, oesophagus, Neck (includingsalivary glands, thyroid, parathyroids, neck spaces etc.), orbit, skull base including related meningeal systemand brain, Central Auditory/Speech/Language/Vestibular areas, cranial nerves, related lymphovascular andneural systems.

Applied Physiology of phonation, speech & language, breathing, respiration, lacrimation, sound and hearing,balance system including peripheral and central vestibular pathways, smell, taste, mastication, swallowing,CSFphysiology,cranialnerve functions.

ClinicalMethodsforassessmentandevaluationofstructure/function/pathologyofNose andparanasalsinuses,mandible,Ear,Temporalbone,Face,Oralcavity,Pharynx,Larynx,tracheobronchialtree,oesophagus,Neck(includingsalivaryglands,thyroid,parathyroids,neckspacesetc.),orbit,skullbase(includingrelated meningealsystemandbrain, cranialnervesetc.),Speech &Language etc.

Applied physics, equipment, methodology, interpretation of various tests for**Audiological**evaluation andtheirapplication indifferentclinicalscenariosand differentagegroups.

Applied physics, equipment, methodology, interpretation of various tests of **Vestibular** evaluation and theirapplicationindifferentclinicalscenarios anddifferentage groups.

MedicalEducationTechnologyincluding(butnotlimitedto)competencebasedmedicaleducation,integratedteaching, newerteachingtoolsandmethodsetc.

Research Methodology including (but not limited to) various research designs, biostatistics and relatedfactorslike sampling, biasetc.

BasicsofEvidencebasedMedicineandGoodClinical Practice.

Principles, technique and clinical applications of various **facial aesthetic, plastic** (including but not limited toRhinoplasty, Otoplasty, Pinna reconstruction) and **reconstructive** procedures and newer advancements inE.N.T.,Head-Neckand SkullBase pathologies.

General pathologic aspects such as wound healing and also Pathology and Pathogenesis of E.N.T. diseases,Pharmacology,genetics,cytology,haematology,bloodtransfusionandimmunologyasapplicabletootolaryngology.

Principles,techniquesandclinicalapplicationsofvarious**targetedtherapies**forvarious Otorhinolaryngologic, Skull Base and Head & Neck tumours including (but not limited to) Gene therapy,molecularbiologyand immunotherapyetc.

Principles, techniques and applications of various **chemotherapeutic agents** related to Otorhinolaryngologic,Skull Baseand Head &Necktumours.

Principles,techniquesandnewermodalitiesofmanagementof**traumaandemergencies**inOtorhinolaryngologic, Skull Base and Head & Neck (including but not limited to fractures, CSF leaks, foreignbodies,airwayobstructions, bleeding,face and neckinjuries,hearingloss,vertigoetc.).
Principlesandtechniquesof**Anaesthesia**inOtorhinolaryngologic,SkullBaseandHead& Neckprocedures/surgeriesincludingnewer modalities.

Pathology, clinical presentation, diagnosis and medical /surgical /rehabilitative management of variousdiseases of ear, nose, throat, Head-neck, skull base region, larynx, trachea, oesophagus (including but notlimited to congenital, developmental, inflammatory, infectious, neoplastic, traumatic, neurological, immuneandidiopathic disorders).

Evaluation and management of various **Skull Base Disorders** (including but not limited to Pituitary, orbit, CPAngle,variouscranialfossa, Infratemporal/pterygopalatinefossa,clivus etc.).

Principles of management of ear, nose, throat, Head-neck, skull base region disorders **in pediatric andgeriatric** population.

Principles of **Preventive and Community Medicine** related to ear, nose, throat, Head-neck, skull base regiondisorders.

Principlesofdiagnosis,evaluationandmanagement of**SleepDisorders**.

Recent advances in the field with relevant technological concepts and their

clinical applications. It includes(butnotlimitedto)computers,lasers,poweredinstrumentations,energydeliverydevices,navigations,endoscopes, hearing aids and implants, cochlear and brain stem implants, stereotactic radiosurgery, gammaknife,cyber knife,robotics,variousultrasonicdevicesforsurgery,Optical Fluorescence,Microscopesetc.

Concepts, technique, clinical applications and interpretations of various related **Radiological** investigations,radiologicalinterventionsand newermodalitiesin E.N.T.,Head-NeckandSkull Base pathologies.

Concepts, technique and clinical applications of various related**Radiotherapeutic** modalities and neweradvancementsin E.N.T., Head-Neckand SkullBase pathologies.

Concepts, technique, clinical applications and interpretations of various related **Nuclear Medicine** modalitiesandnewer advancements inE.N.T., Head-Neckand Skull Base pathologies.

PrinciplesofmedicalJurisprudenceandEthicsinclinical practice.

- **Recent advances and developments in the discipline.**

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17-OPHTHALMOLOGY

1.Basic Anatomy of Eye.2.Physiologyof Eye.

3.OpticsandRefractionofEye.

4.Eyelids-
Benignnodulesandcysts,benignepidermaltumors,benignpigmentedlesions,benignadnexaltumors,miscellaneousbenigntumors,malignant tumors, disorders of lashes, allergic disorders, bacterial infections,viralinfections,blepharitis,ptosis,ectropion,entropion,miscelleneousacquireddisorders,cosmeticeyelidandperiocularsurgery,congenitalmalformations.

5.LacrimalDrainageSystem-
Physiology,causesofawateringeye,evaluation,acquiredobstruction,congenitalobstruction,lacrimalsurgery,chroniccanaliculitis,dacryocystitis.

6.Orbit- Thyroid eye disease, infections, non-infective inflammatory disease,vascular malformations, carotico-cavernous fistula, cystic lesions, tumors, theanophthalmicsocket, craniosynostoses.

7.DryEyeDisorders-Definitions,physiology,classification,sjogrensyndrome, clinicalfeatures,specialinvestigations,treatment.

8.Conjunctiva-
Bacterialconjunctivitis,viralconjunctivitis,allergicconjunctivitis,conjunctivitisinblisteringmucocutaneousdisease,miscellaneousconjunctivitis,degenerations.

9.Episclera and Sclera- Episcleritis, immune-mediated scleritis,

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infectiousscleritis,scleraldiscoloration,bluesclera,miscellaneousconditions.

10. **Lens-**Acquiredcataract,managementofage-relatedcataract,newertechniquesofcataractsurgeries,congenitalcataract,ectopial entis,abnormalitiesof shape,latestdevelopmentof IOLdesigns.

11. **Glaucoma-**Tonometry,gonioscopy,evaluationoftheopticnerve,imaging in glaucoma, perimetry, ocular hypertension, primary open-angleglaucoma,normal-pressureglaucoma,primaryangle-closureglaucoma,classificationofsecondaryglaucoma,pseudoexfoliation,pigment dispersion, neovasculargl aucoma,inflammatoryglaucoma,lensrelatedglaucoma,traumaticgl aucoma,iridocornealendothelialsyndrome,glaucomainintraocular tumors, glaucoma in epithelial growth, glaucoma in iridoschisis,primarycongenitalglaucoma,iridocornealdysgenesis,glaucomainphac omatoses,glaucomamedications,newerantiglaucomadrugs,lasertherapy,trabecu lectomy,non-penetratingsurgery,antimetabolitiesinfiltrationsurgery,drainageshunts.

12. **Cornea-** The cornea: basic structure and function, limbal stem cell and itsclinical application, ocular surface rehabilitation, examination and evaluationtechniques of cornea, corneal blindness, epidemiology, infectious diseases ofcornea, immunologic diseases of cornea, metabolic and congenital diseases ofcornea, conjunctival corneal dysplasia and malignancy, corneal dystrophiesand degeneration, corneal surgeries including emerging innovation, moderneyebanking : Advancesand challenges.

13. **Retina-** Retinal imaging and diagnosis, basic sciences related to retina,genetics in relation to retina, hereditary retinal and choroidal disease, maculardystrophies,retinalvasculardiseases,agerelatedmaculardisease,inflamm atory and infective diseases of retina and choroid, retinal detachmentincluding newer treatment modalities, surgeries of vitreous and retina, tumorsofretinaand choroid,endophthalmitis,artificialvision.

14. **UvealTissue-**
Classificationofuveitis,immunemechanismineyes,clinicalfeatures,specialinvestig ations,principlesoftreatment,roleofimmunosuppressantsinuveitis,intermediateu veitis,uveitisinspondyloarthropathies, uveitis in juvenile arthritis, uveitis in bowel disease,uveitisinrenaldisease,sarcoidosis,behcetsyndrome,toxoplasmosis,toxoc ariasis, miscellaneous parasitic uveitis, uveitis in immuno deficiencysyndrome, miscellaneous viral uveitis, fungal uveitis, bacterial uveitis, whitedot syndromes, primary sttomal choroidits, miscellaneous anterior uveitis,miscellaneousposterior uveitis.

15. **Ocular Tumors** - Benign epibulbar tumors, malignant and premalignantepibulbar tumors, iris tumors, iris cysts, ciliary body tumors, tumors of thechoroid,neuralretinaltumors,vascularretinaltumors,primaryintraocular lymphoma,tumorsoftheretinalpigmentepithelium,paraneoplasticsyndromes.

16. **Strabismus-**
Amblyopia,clinicalevaluation,heterophoria,vergenceabnormalities,esotropia,exo tropia,specialsyndromes,alphabetpatterns,surgery.

17. **Neuro-Opthalmology-** Neuroimaging, optic nerve, pupillary reactions,chiasma,retrochiasmalpathways,ocularmotornerves,supranucleardiso rdersofocularmotility,nystagmus,carotidstenosis,intracranialaneurysms,ocular myopathies,neurofibromatosis,migraine,facialspasm.

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18. **OcularPharmacology.**
19. **Trauma-**Eyelidtrauma,orbitalfractures,traumatotheglobe,chemicalinjuries.
20. **CausesandPreventionofBlindnessincludingNPCB&Vision2020.**
21. **OcularmanifestationsofSystematicdiseaseseg.DiabetesMellitus,Hypertension,AIDS,RenalDisorders,Thyroid,Diseasesandothers.**
22. **ClinicalmethodsandrecentadvancesinOphthalmology.**

- **Recent advances and developments in the discipline.**
- **Proptosis-Causes and management**
- **Ocular Microbiology**

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18A-OBSTETRICS AND GYNAECOLOGY

1. BASICSCIENCES:-Appliedandbasicsofanatomy,physiology,Bio-Chemistry, Pharmacology,Pathology, Microbiology, Endocrine andGeneticsinrelationtoobstetrics&Gynaecology.
2. OBSTETRICS:-

(i) NormalObstetrics.
(ii) HighRisk&criticalObstetrics.
(iii) OperativeObstetrics&AppliedAnesthesia.(iv)ImaginginObstetrics.
(v) Prenatal Diagnostics&fetal medicine.
(vi)Neonatology.
(vii)SocialObstetrics

3. GYNAECOLOGY:-

(i) FullrangeofGynaecologicalconditions,theirdiagnosticworkupand management.
(ii) AllaspectsofoperativeGynaecology.
(iii) Reproductiveendocrinologyandinfertility.(iv)GynaeOncology.
(v)Adolescent&GeriarticHealthandGynaecology.(vi)BreastDiseases.
(vii) MedicolegalaspectsinObst&Gynaeandexaminationof victims ofSexualassault.
(viii) ReproductiveTractInfections.

4. CONTRACEPTION:-

(i)PopulationControl&FamilyWelfareandPlanning.(ii)StatisticalDemography.
(iii)MTPandComprehensiveabortioncare.

5. RECENTADVANCES
6. HEALTHPROGRAMMES&POLICIES[NATIONAL&STATE(Rajasthan)]
7. BIOMEDICALRESEARCH&MEDICALEDUCATIONTECHONOLOGY
8. BASICCOMMUNICATIONSKILLS&COUNSELLING.

- **Recent advances and developments in the discipline.**

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18B-OBSTETRICS AND GYNAECOLOGY(ASSISTANT PROFESSOR/ANTENATAL CARE INCHARGE) AND **(**MATERNINTY AND CHILD WELFARE OFFICER) [Level-11]

1. BASICSCIENCES:-Appliedandbasicsofanatomy,physiology,Bio-Chemistry, Pharmacology,Pathology, Microbiology, Endocrine andGeneticsinrelationtoobstetrics&Gynaecology.
2. OBSTETRICS:-

(iv) NormalObstetrics.
(v) HighRisk&criticalObstetrics.
(vi) OperativeObstetrics&AppliedAnesthesia.(iv)ImaginginObstetrics.
(v) Prenatal Diagnostics&fetal medicine.
(vi)Neonatology.
(vii)SocialObstetrics

3. GYNAECOLOGY:-

(iv) FullrangeofGynaecologicalconditions,theirdiagnosticworkupand management.
(v) AllaspectsofoperativeGynaecology.
(vi) Reproductiveendocrinologyandinfertility.(iv)GynaeOncology.
(v)Adolescent&GeriarticHealthandGynaecology.(vi)BreastDiseases.
(ix) MedicolegalaspectsinObst&Gynaeandexaminationof victims ofSexualassault.
(x) ReproductiveTractInfections.

4. CONTRACEPTION:-

(i)PopulationControl&FamilyWelfareandPlanning.(ii)StatisticalDemography.
(iii)MTPandComprehensiveabortioncare.

5. RECENTADVANCES
6. HEALTHPROGRAMMES&POLICIES[NATIONAL&STATE(Rajasthan)]
7. BIOMEDICALRESEARCH&MEDICALEDUCATIONTECHONOLOGY
8. BASICCOMMUNICATIONSKILLS&COUNSELLING.

- **Recent advances and developments in the discipline.**

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19-RADIODIAGNOSIS

Unit:I Basic Science

A. **Anatomy–**Embryology,Gross andcrosssectionalanatomyof all thebody
B. systems ofhuman.
C. **Pathology-** Grossmorphologyofpathologicalconditionsofsystemicdiseasesaffectingallorgansystems.
D. **HumanPhysiology -**Basichumanphysiologyofallsystem&organs.

Unit:IIClinical Radio-diagnosis

Thiswouldcoverimagingandinterpretation ofdiseasesaffectingallthe bodysystems:

1. **Musculo-skeletal System-** Interpretation of diseases of muscles, soft tissue, bones and jointsincludingcongenital,inflammatory,traumatic,endocrineandmetabolic,neoplasticandmiscellaneousconditions.
2. **Respiratory System-** Interpretation of diseases of the chest wall, diaphragm, pleura and airway;pulmonaryinfections,pulmonaryvasculature;pulmonaryneoplasm;diffuselungdisease;mediastinaldisease, chest trauma; post-operativelungand X-rayin intensive care.
3. **CardiovascularSystem-** Interpretationofdiseasesanddisordersofcardiovascularsystem(congenitalandacquiredconditions)andtheroleofimagingbyconventionalradiology,ultrasound,colour Doppler, CT,MRI,AngiographyandIsotopes Studies.
4. **Gastro-intestinal tract and hepato-biliary pancreatic system-** Interpretation of diseases anddisordersofmouth,pharynx,salivaryglands,esophagus,stomach,smallintestine,largeintestine, diseases of omentum, peritoneum and mesentery: acute abdomen, abdominal trauma.Diseasesanddisorders of liver, biliarysystemandpancreas.
5. **Urogenital System-** Interpretation of various diseases and disorders of genitorurinary system.Theseinclude:congenital,inflammatory,traumatic,neoplastic,calculusdiseaseandmiscellaneousconditions.
6. **Central Nervous System (C.N.S.)-** Interpretation of diseases and disorders of the head, neckand spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolicandmiscellaneous condition.
7. ImaginginEmergencyMedicine.
8. ImaginginObstetricsandGynecology.
9. ImagingofBreastandinterventionalprocedures.
10. ENT,EYEandDentalImaging.
11. Imagingofendocrineglands andthoseinvolvedwithmetabolicdiseases.
12. Clinicalappliedradionuclideimaging.
13. InterventionalRadiology.

Unit:IIIRadiologicalPhysics

1. Introductionofgeneral propertiesofradiationandmatter:Fundamentalsofnuclearphysicsandradioactivity.
2. Interactionofx-raysandgammarayswithmatterandtheir effectsonirradiatedmaterials.

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3. X-rayGenerating Apparatus.
4. Screen-filmradiography.
5. Filmprocessing:Dark room,dryprocessing,laser /drychemistrycameras,artifacts.
6. Fluoroscopy:IITV,Digital includingflat panelunits andfluoroscopycumradiographyunits.
7. Digitalradiography:ComputedRadiography,Flatpanelradiography.
8. Otherequipments:UltrasoundincludingDoppler,CT,DEXA,MRI,and DSA.
9. ContrastMedia (Barium, Iodinated, MR & Ultrasound contrast) - types,chemicalcomposition,mechanismofaction,doseschedule, routeofadministration,adversereactionandtheirmanagement.
10. NuclearMedicine:Equipmentsincludingscintigraphy,Bonescan,SPECT&PET. Isotopesinvariousorgan systemsand recent advances.
11. Radiationbiology&Hazards, Radiationprotection anddosimetry.
12. Imagequalityand QualityAssurance (QA).
13. Regulatorycontrolfor radiationinIndia&abroad-e-LORA, AERB,ICRP.

Unit:IVGeneral&SpecializedRadiographyandprocessingtechniques
1. Processingtechniques:includesdarkroomand dryprocessing.
2. Radiographyofthemusculo-skeletal systemincludingextremities.
3. Radiographyof thechest,spine, abdomen andpelvicgirdle.
4. Radiographyoftheskull,orbit,sinuses.
5. Contrasttechniquesand interpretationof GItract, hepato-biliarytract, pancreasetc.
6. ContrasttechniquesandinterpretationoftheCentralNervoussystem.
7. Contrasttechniquesand interpretationofthe cardiovascularsystemincludingchest.
8. Contrast techniques and interpretation of the genito - urinary system including Obstetrics andGynaecology.
9. PaediatricradiologyincludingMCU,genitogram,boneage.10.Dental,portable andemergency(casualty) radiography.

Unit-VRecentadvancesin radio-diagnosis andimaging&itsclinicalapplications
1. Ultrasoundelastography,3-Dprinting,3-D &4-DUltrasonography.
2. DigitalMammography&tomosynthesis, StereotacticBiopsy.
3. DualenergyCTscanner,CTfluoroscopy, CTangiography,MDCT.
4. FunctionalMRI,DTI&advancedMRsequences.
5. PET-CT,PET-MR.
6. Evidencebasedradiology.
7. ArtificialintelligenceinRadio-diagnosis.
8. NuclearMolecularimaging.
9. VariousDiagnostic &therapeuticinterventionsinRadio-diagnosisandtheirtools.
10. Picture ArchivingandCommunicationSystem(PACS)andRadiologyInformationSystem(RIS)tomakeafilm-less department and forTeleradiology.
11. PlanningaModernimagingDepartment.

Unit:VIEthical &Medico-legal Issues in Radio-diagnosis
1. Medico-legalimagingreporting,PC-PNDTact withamendments,Consumerprotectionact.
2. Ethicalissues,Doctorpatientrelationship,Imageinterpretation&reportingissues.

- **Recent advances and developments in the discipline.**

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20-RADIOTHERAPY

Unit-I-BASIC SCIENCES:

- **Anatomy -** Anatomy pertaining to Oncology, Cross-sectional anatomy,Relationship ofvitalstructures.
- **Pathology-**GeneralPathologypertainingtooncology-Malignanttransformation,Criteria for tumor diagnosis, macroscopic, histological & cytological uses & value ofbiopsymaterial,TumorMarkers,Cytogenetics,MolecularPathology,andImmunohistochemistry, Classification of tumors - histogenic, histological, behavioral &immunological. Nomenclature - solid tumors, lymphomas, leukemias Endocrine aspectsof malignancy :- production of hormones by tumors, the effect of hormones on tumors,paracrineeffectsoftumors.Paraneoplasticsyndromes,Etiologyofcancer,Tumorimmunology.
- RadiationOnlcologyPhysics -
  - *StructureofMatter :*Constituentsofatoms,Atomicandmassnumbers,Atomicandmass-energy units, Electron shells, Atomic energy levels, Nuclear forces, Nuclearenergylevels, Nuclear binding energy.
    Electromagnetic radiation, Electromagnetic spectrum, Energy-quantization,Relationship between Wavelength, Frequency, Energy.
  - *Nuclear Transformations :* Natural and artificial radioactivity, Alpha and Beta decay,Decay constant, Activity, Physical, Biological and Effective half-lives, Mean life,Decayprocesses, Radioactiveseries, Radioactiveequilibrium.
  - *Production ofX-rays :* The X-ray tube, X-ray circuits, Physicsof X-ray production,Continuousspectrum,Characteristicspectrum,EfficiencyofX-rayproduction,Distribution ofX-rays in space, Specifications of beam quality, Measurement ofbeamquality, Filters, andfiltration.
  - *Interactionofradiationwithmatter:*Attenuation,Scattering,Absorption,Transmission, Attenuation coefficient, Half Value Layer (HVL), Energy transfer,Absorption,andtheircoefficients.Photoelectriceffect,ComptonEffect,Pair-production, Relative importance of different attenuation processes at variousphotonenergies.
    Electroninteractionswithmatter:Energylossmechanisms-Collisionallosses,Radiative losses, Ionization, Excitation, Heat production, Delta rays, Polarizationeffects, Scattering, Stopping power,Absorbed dose, secondaryelectrons.
    Interactionsofchargedparticles:Ionizationvs.Energy,Stoppingpower,LinearEnergyTransfer(LET),Braggcurve,Definitionofparticlerange.
  - *Measurementofradiation :*Radiation Detectors : Gas, Solid-state,Scintillation,Thermoluminescence,VisualImaging(Film,Fluorescentscreens),andtheirexamples.
    Exposure, Dose, Kerma : Definitions, Units (Old, New), Inter-relationships betweenunits, Variation with energy

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and material. Measurement of exposure(Freeairchamber,Thimblechamber),Calibrationofthera pybeams:Concepts,Phantoms.
Qualityassurancecheckson radiation therapyunits.
Protocols(TG21,IAEATRS-277,TG51)Dosedeterminationinpractice *(briefoutlineonly, detailsnotrequired)*

- *Radiotherapy Equipment:* Grenz ray, Contact,Superficial, Orthovoltage or Deeptherapy,Supervoltage,Megavoltage therapy.Therapy anddiagnostic X-ray units –comparison.
  Filters,factorsaffecting output,principlesofcooling.Betatrons.
  *Co-60units:*Comprehensivedescriptionoftheunit,Safetymechanisms,Sourcecapsule.
  Linear accelerators: History, Development, Detailed description of a modern, dualmodelinearaccelerator,Linachead,anditsconstituents,Safetymechanisms,Computer-controlledlinacs,RecordandVerifysystems,Relativemeritsanddemeritsof Co-60andlinacunits, *Betatrons,Cyclotrons:*forneutrontherapy,*Simulators:*Need forthem,Detaileddescription ofatypical unit, SimulatorCT.
- *Basic ratios,Factors,Dose distributions,Beam modificationsandShapinginTeletherapybeams.*
  Characteristicsofphotonbeams:Qualityofbeams,DifferencebetweenMVandMeV,Primaryand scattered radiation.
  Percentage depth dose, Tissue-Air Ratio, Scatter Air Ratio, Tissue-Phantom Ratio,TissueMaximum Ratio, Scatter Maximum Ratio, Back Scatter Factor, Peak ScatterFactor,Off-AxisRatio,Variationoftheseparameterswithdepth,fieldsize,source-skindistance,beamqualityorenergy,beamflatteningfilter,targetmaterial.
  Central,axis depth doseprofiles forvarious energies.
  Equivalentsquareconcept,Surfacedose(entranceandexit),Skinsparingeffect,Outputfactors.
  *Practicalapplications:*Co-60calculations(SSD,andSADtechnique),Acceleratorcalculations(SSD, and SADtechnique)
  Beam profiles, Isodose curves, Charts, Flatness, Symmetry, Penumbra(Geometric,Transmission and Physical), Fieldsizedefinition.
  Bodyinhomogeneities:Effectsofpatientcontour,Bone,Lungcavities,Prosthesison dose distribution. Dosewithin bone / lung cavities, Interface effects, ElectronicDisequilibrium,Wedgefiltersandtheiruse,Wedgeangle,Wedge Factors,Wedgesystems (External, In-built Universal, Dynamic / Virtual), WedgeisodosecurvesOther beam modifying and shaping devices: Methods of compensation for patientcontour variation and/ortissue inhomogeneity- Bolus, Build up material,Compensators,Merits and Demerits. Shielding of dose-limiting tissue:Non-divergentandDivergent.
  beamblocks,Independentjaws,Multileafcollimators,MeritsandDemerits.

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- *Principlesof TreatmentPlanning-I*
  Treatment planning for photon beams: ICRU 50 and relevant ICRU reports andNACP terminologies. Determination of body contour and localization:Plain film,Fluoroscopy, CT, MRI, Ultrasonography, Simulator based Methods of correction forbeam"s oblique incidence, and body inhomogeneities. SSD technique and isocentric(SAD) technique: Descriptions and advantages ofSADtechnique. Combination offields : Methods of field addition, Parallel opposed fields, Patient thickness vs. Doseuniformityfordifferentenergiesinaparallelopposedsetup,Multiplefields(3 fields, 4 field box, and other techniques). Examples of above arrangements offields in SSD and SAD techniques, Integral Dose, Wedge field technique, RotationTherapy (Arc, and Skip), Tangential fields. Beam balancing by weighting. Total andHemi-bodyirradiation. Field junctions.
- *Principlesoftreatment planning –II*
  Limitationsofmanualplanning.Descriptionofatreatmentplanningsystem(TPS):2D and 3D TPS. Beam data input, Patient data input (simple contour, CT, MR data,Advantagesoftransferthroughmedia),Inputdevices(Digitizer,floppies,DATdevices,Magneto-opticaldisks,directlinkwithCT,MR).Beamselectionandplacement,Beam"sEyeView(BEV),Dosecalculationanddisplay(Pointdose,Isodosecurves,Isodosesurfaces,Colorwash).Planoptimization,Planevaluationtools:Dose-VolumeHistograms(CumulativeandDifferential),Hardcopyoutput,Storageand retrieval of plans.
  *AlignmentandImmobilization:*Externalandinternalreferencemarks,Importanceof immobilization in radiotherapy, Immobilization methods (Plaster of Paris casts,Perspex casts, bite block, shells, headrests, neck rolls, Alpha-Cradles, Thermoplasticmaterials, polyurethane foams), Methods of beam alignment(isocentricmarks, lasermarks, and front/backpointers).
  *Treatment execution :*Light field,Crosshair,ODIs,Scales in treatment machines.*Treatment verification:* Port films, Electronic portal imaging devices, In-vivo patientdosimetry (TLD, diode detectors, MOSFET, Film, etc) Changes inpatient position,targetvolume, and critical volumeduringthecourseoftreatment.
- *ElectronBeamTherapy*
  *Productionofelectron beams :*Productionusingaccelerators, Characteristics ofelectrons. Surface dose, percentage depth dose, beam profiles,Isodose curves andcharts,FlatnessandSymmetry.Beamcollimation,thevariationofpercentagedepthdoseandoutputwithfieldsize,andSSD,photoncontamination. Energyspectrum,Energyspecification,thevariationofmeanenergywithdepth.Suitabilityofmeasuringinstrumentsfor electron beam dosimetry.
  Treatment planning : Energyandfield size choice, air gaps, and obliquity, Tissueinhomogeneity–lung,bone,air-filledcavities.Fieldjunctions(witheitherelectronorphotonbeam).Externalandinternalshielding.Arctherapy,Useofthebolusinelectronbeam.TotalSkinElectron Irradiation,IntraoperativeRadiationTherapy.
- *Physical Principles of Brachytherapy :* Properties of an ideal brachytherapy source,Sourcesusedinbrachytherapy:Ra-226,Cs-

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137,Ir-192,Au-198,Co-60,I-125,Sr-90,Yt-90,Ru-106,Ta-182,andothernewradionuclides,They'recompletephysicalproperties,Radiumhazards.Sourceconstructionincludingfiltration,comparativeadvantagesoftheseradionuclidesHistoricalbackground.RadiationandDoseunits:Activityused,Exposure,AbsorbedDose,mg-hr,curie,milli-curiedestroyed,milligramRadiumequivalent,roentgen,rad,gray.Sourcestrengthspecification,BrachytherapyDosecalibrator.

Techniques : Pre-loaded, Afterloading (manual and remote), Merits and Demerits.Surface, Interstitial, Intracavitary, Intraluminal, Intravascular brachytherapy. Low,Medium,HighandPulseddoserates.Remoteafterloadingmachines,Detaileddescriptionofanyoneunit.

Dosage systems: Manchester System(outline only), Paris System(workingknowledge).

Treatment Planning: Patient selection, Volume specification, Geometry of implant,Number,Strength,and Distributionofradioactivesources,Sourcelocalization,Dosecalculation, Doserate specification,Recordkeeping.ICRU 38.

*RadiationSafety:*Planningofbrachytherapyfacility,Rooms,andequipment,StorageandMovementcontrol,Sourceinventory,Disposal,Regulatoryrequirements, Beta-ray brachytherapy including methods of use, inspection, storageandtransport ofsources,dosedistribution.

*Unsealedradionuclides:*Conceptsofuptake,distribution,andelimination, Activities used in clinical practice, Estimationofdose to targettissues, andcritical organs,Proceduresforadministering radionuclides to patients.

- *QualityAssurancein radiotherapy (QART)*
  Overview of ESTRO QART : Need for a quality system in Radiotherapy,
  QualitySystem:Definitionandpracticaladvantages,Construction,Development,andImplementationofaQualitySystem.
  Quality Assurance ofSimulator, TPS, Co-60, linear accelerator.AcceptancetestingofSimulator,TPS,Co-60,linearaccelerator.
- *Radiation Protection from ExternalandInternalsources andRegulatory Aspects :StatutoryFramework*– PrinciplesunderlyingInternationalCommissiononRadiation.
  Protection (ICRP) recommendations. ICRP and National radiation protection
  i.e.AtomicEnergyRegulatoryBoard(AERB)standards.Effectivedoselimits (ICRPand AERB).
  Protection mechanisms : Time, DistanceandShielding. Concept of"AsLow AsReasonablyAchievable" (ALARA).
  Personnel and Area Monitoring : Need for personnel monitoring, Principles of filmbadge, TLD badge used for personnel monitoring. Pocket dosimeter. Need for areamonitoring, GammaZonemonitors, Surveymeters.
  Regulatory aspects : Procedural steps for installation and commissioningofanewradiotherapyfacility(TeletherapyandBrachytherapy).ApprovaloftheStandingCommitteeonRadiotherapyDevelopmentProgramme.Typeapprovalofunit.Siteplan, Layout of installation/Associated facility: Primary, Secondary barriers,

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leakage,andscatteredradiation.Theregulatoryrequirementintheprocurementofteletherapy/Brachytherapysource(s).Constructionofthebuilding, Qualifiedstaff,Procurementofinstruments,andaccessories,Installationofunitandperformancetests,Calibrationoftheunit,RP&ADapprovalforclinicalcommissioningoftheunit.

Other regulatory requirement s: Regulatory consent, NOCs, Periodical reports toAERB and Radiological Physics and Advisory Division (RP&AD), Bhaba AtomicResearchCentre(BARC).

- *AdvancementsinRadiationOncology:*
  VirtualSimulation:Principle,CT-Simulation,TPSbasedvirtualsimulation,Differences,Merits andDemerits, Practical considerations.
  Conformal radiotherapy (CRT): Principles, Advantages over conventional methods,Essentialrequirements for conformalradiotherapy.

Variousmethodsof CRT:

1. Withcustomizedfield-shapingusingconventionalcoplanarbeams
2. Multiplenon-coplanarMLCbeams conforming toatargetshape
3. Stereotacticradiotherapy
4. Principleof InverseplanningandIntensityModulatedRadiationTherapy(IMRT)
   - Using3Dcompensators
   - StaticIMRT(Stepand shoottechnique)
   - DynamicIMRT(slidingwindowtechnique)
   - DynamicarcIMRT
   - Micro-MLC
   - Tomotherapymethods
5. Time gated (4D) radiotherapy, Merits and demerits of IMRT, Stereotactic irradiationmethods: Physics principles, Techniques, Description of Units(GammaKnifeandLinacbased-CyberKnife,Tomotherapy),Meritsanddemerits, Stereotactic Radiosurgery (SRS) and Stereotactic Radiotherapy (SRT), Whole bodystereotactic frame.
   Networkinginradiotherapy:Networkingofplanningandtreatmentunitsinaradiotherapy, department including Picture Archival Communication System (PACS),Advantages,Patient, DataManagement.

- *PlanningofaRadiotherapyDepartment*

Building designs, Choice of various types of equipment and sources, Acceptance andCalibrationTests, Various maintenancestepsandprocedures.

- Radiobiology
  - ☐ IntroductiontoRadiationBiology.
  - ☐ Radiationinteractionwithmatter.
  - ☐ Introductiontofactorsinfluencingradiationresponse.
  - ☐ Therelevanceofradiation biologyto radiotherapy.
  - ☐ Interactionofionizingradiationonmammaliancells.
  - ☐ Organradiosensitivityandradioresponsiveness, theconcept oftherapeutic index.
  - ☐ AcuteeffectsonRadiation.
  - ☐ RadiationEffectsonMajorOrgans/tissues.
  - ☐ Lateeffectsofradiation(somatic).
  - ☐ LateEffectsofRadiation(Genetic).

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- ☐ EffectsofRadiation onHuman Embryo&Fetus.
- ☐ Biologyand Radiation Response ofTumors.

- AppliedRadiobiology

  Fractionation:rationale,factorsinvolved(4R"s).
  Time,dose,andfractionationrelationship:isoeffectcurves,isoeffectrelationships,
  e.g.NSD,CREformalismsandtheirlimitations,partialtolerance,meansofsummatingpartial tolerance, steepness ofdose-response curves.
  Multi-target, two-component and linear-quadratic model. a/b ratios for acute and lateeffectsandmeansofderivingthesevalues.Isoeffectiveformulae.Clinicalapplicationsofthe L-Qmodel,hyperfractionation,acceleratedfractionation,hypofractionation, CHART, split dose treatments.
  Brachytherapy-low doserate,high dose rate,and pulsedtreatments.
  Introduction to new techniques to optimize radio-curability; combination therapy(adjuvantsurgeryorchemotherapy),hyperthermia,hypoxiccellradio-sensitizes,highLET radiation. Photodynamictherapy.
  Thevolumeeffect,generalprinciples,andcurrenthypotheses.ShrinkingField technique.
  CombinationRadiation-Surgery
  Pre-,post-andintra-operativeradiation.
  Rationale,radiobiologicalfactors,currentclinicalresults.
  Irradiationofsub-clinicaldisease,debulkingsurgery,theimportanceofclonogenicnumbers.
  CombinationRadiation-Chemotherapy
  Definitions of radio sensitizer, synergism, potentiation, antagonism.Radiosensitizers:types,mechanism.
  Hyperthermia Sources, the rationale (historical examples), advantagesanddisadvantages, thermo tolerance.
  Cellular damage: comparison and contrast with radiation, thermal and non-thermaleffects ofultrasound,microwaves,radiofrequency, etc.
  Generalhostresponses(immunology,metastases).
  Usealongwithradiotherapyandchemotherapy:optimumsequencingofcombinedmodalities.Current limitationsto theclinical use ofhyperthermia.

- HighLETRadiation

  Comparisonandcontrast withlow LETradiation.
  Neutrons: source (including 252 Cf) and boron neutron capture (outline only).Advantagesanddisadvantagesofneutrons,RBEvalues,hazardsoflowdoseandlowenergyneutron,useinradiotherapy,combinationwithlowLET,currentclinicalresults.OtherhighLETparticles:protons,mesons,high-energyheavynuclei,applicationtoradiotherapy, currentclinicalresults.

- NuclearMedicine

  - ☐ **Radiopharmaceuticals**

  (a) PhysicalandChemicalCharacteristicsofradionuclideusedinNuclear Medicine.
  (b) Radiopharmacygeneratorproducedradiopharmaceutical.
  (c) Criteria forselectionofradionuclide.
  (d) Thebiologicalbehaviorofradiopharmaceuticals.
  (e) Qualitycontrol.

(f) Mechanismoflocalization.
(g) Radiopharmaceuticalsfortherapy.
(h) PositronEmissionradio-nuclidetheirpreparation,variousmodulesofnuclearreactions,targetreactions, and chemistry.
(i) SpecifictopicsonBoneseekingRadiopharmaceutical,Hepatobiliary,Tumorseeking,Cardiac Imaging, Radiopharmaceuticals forResearch, etc.

- TherapeuticusesofRadionuclide

ApplicationofisotopeinTherapyin thefollowingareas:
1) Thyrotoxicosis
2) Cancer Thyroid –both lowdose&high dose
3) BonePalliation usingP32, Sr 89 &Sm153.
4) I-131 LipidolforHepaticcancer

- Clinicaltrials -Statisticalbasisforplanning&interpretation

ClinicalTrials.

- Advantages &disadvantages
- Retrospective&prospectivestudies
- Controlled&uncontrolled trials
- Single-blind&double-blind studies
- Phase I,II&IIItrials
- Ethics(Helsinkideclaration).

Unit-II-CLINICALRADIOTHERAPY:

- **CancerEpidemiology&Etiology**
  - CancerStatistics-worldwide&India
  - CancerRegistries &NationalCancerControlProgramme.
  - Analysisofdataincancerregistries.
  - RegionalCancerCenters
  - CancerScreening&Prevention.
- PatientCare
  - Assessment&referralsystems forradiotherapy
  - Diagnosis&workup.
  - Staging.
  - Care&evaluationduring &after treatment.
  - EmergenciesinOncology.
  - Managementofdifferentmalignancies ie. SkinCancer,CentralNervous SystemTumor/OrbitalTumors/SpinalTumors, Head and Neck Tumors, Thoracic Tumors, Breast Tumors, Gastrointestinal Tumor,Liver,Gallbladder,bileduct,andpancreatictumors,PediatricTumors,GynecologicTumors,MaleGenitourinaryTumors,UrinaryTractTumors,EndocrineTumors,HematologicalMalignancies– Leukemias,lymphomasandPlasma cell.Neoplasm Sarcomas ofBone and Soft tissues.Metastasis of UnknownOrigin,AIDS-related Malignancies,OncologicEmergencies. Endocrine aspects of malignancy :- production of hormones bytumors, effect ofhormonesontumors,paracrineeffectsoftumorsParaneoplasticsyndromes,BenignDiseases, Hereditarycancer syndromes.
- TechniquesofRadiotherapy
  - Small field beam directed therapy
  - Extendedandirregularfield therapy

- Beammodificationtherapy
- Rotationarctherapy
- Intracavitary,interstitialandmoldapplication

- Treatmentplanningandpresentation
  - Moldroompractices
  - Simulation
  - Thecomputerizedtreatmentplanningsystem
  - Clinicaldosimetry
  - Prescriptionandexecution
- TreatmentResponse&Result
  - Guidelinesfortreatmentresponseassessment-CompleteResponse,PartialResponse,No Response,and Stabledisease.
  - Endpointsoftreatmentresults:Loco-regionalcontrol,recurrence,metastasis,survival, qualityof life.
  - Treatment-relatedmorbidityassessment
    (i) Radiation morbidity(early&late)
    (ii) Morbiditiesofcombinedtreatment
    (iii) GradingSystems.

Unit-III-CLINICALCHEMOTHERAPY:

- **Basicprinciplesandclinicalpracticeofchemotherapy**
  - ClassificationofChemotherapydrugs.
  - Newerchemotherapeuticagents.
  - Clinicalapplicationof
    - Singledrugtherapy
    - Polychemotherapyandvariouscombinations
    - Adjuvanttherapy
    - Prophylactictherapy
  - Chemotherapypracticein various malignancies.
  - Chemotherapypractice &results/toxicitiesinsequential&concomitantChemoradiotherapy.
  - Supportivecareforchemotherapy.
  - Thebasicprinciplesunderlyingtheuseofchemotherapeutic agents.
    (i) Classification and mode of action of cytotoxic drugs.The principles ofcellkillby chemotherapeuticagents,drugresistance,phase-specific,andcycle-specificaction.
    (ii) Drug administration. The general principles of pharmacokinetics; factorsaffectingdrugconcentration„invivo“includingrouteandtiming of administration,drugactivation,plasmaconcentration,metabolism, andclearance.
    (iii) Principles of combinations of therapy, dose-response curves, adjuvantand neoadjuvant chemotherapy, sanctuary sites, high dose chemotherapy, andregionalchemotherapy.
    (iv) Toxicityofdrugs.Early,intermediateandlategeneticandsomaticeffectsofcommonclassesofanticancerdrugs.Precautionsinthesafehandlingofcytotoxicdrugs.
    (v) Endocrinemanipulationandbiologicalresponsemodifiers.Anunderstanding of the mode of action and side effects of common hormonalpreparations used in cancer therapy (including

corticosteroids). Use of themajor biological response modifiers such as interferon"s, interleukins, andgrowthfactorsand knowledgeof theirsideeffects.

(vi) AssessmentofNewAgents.PrinciplesofphaseI, II,and IIIstudies.

(vii) GeneTherapy

- Immunotherapy-Clinicalapplicationandusesinvariousmalignantconditions,toxicity and toxicitymanagement.

Unit-IV-OtherDisciplinesAlliedtoRadiotherapyandOncology :

- ***PrinciplesandPractice***ofgeneralsurgery,gynecologyandpediatricSurgeryas related to cancer.
- Basicprinciplesofsurgicaloncology,biopsy,conservationsurgery,radicalsurgery,palliative surgery.
- MethodsofClinicalstagingandTNMclassification.
- Basicsofsurgicaltechniques-head&neck,breast,thorax,abdomen,gynecological, genitourinary,musculoskeletal, CNS.
- Combinedtreatments:withradiotherapy,chemotherapy,andhormonetherapy.
- Preventiveoncology
- Prevention and earlydetectionofcancer.

Unit-V-PALLIATIVE CARE:

- Guidelinesforpalliative care
- Symptomsofadvancedcancer
- Managementofterminallyillpatients.
- Differentpharmacologic &non-pharmacologicmethods
- Paincontrol, WHOguidelines foradults &children.
- Palliativeradiotherapy
- Palliativechemotherapy
- Homecare
- Hospicecare
- Physical,social,spiritual&otheraspects.

Unit-VI-Research,TrainingandAdministration:

- **Researchin Oncology**
  - Howtoconductresearch
  - Guidelinesforbiomedicalresearch:Animalstudies,drugstudies,humantrial.
  - Cancerclinicaltrials.PhaseI/II/III
  - Ethicsofclinicalresearch
  - Evidence-basedmedicine.
- AdministrationRadiotherapyandOncology.
  - ClinicalOncologists"roleasanadministrator.
  - HowtosetupaRadiotherapyandOncologydepartment,planningofinfrastructure&Equipment.
  - Cancerregistryand epidemiology
  - Roleinthecancercontrolprogram, Cancerscreeningprograms
  - Responsibilitiestowards safety&qualityassurance.
- Specialtopics
  - ☐ OncologicalEmergencies
  - ☐ TLI, Extracorporealirradiation (ECI) andTBI–RoleandTechniques

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- ☐ Radiationtreatmentofbenign diseasesandtumor-likeconditions
- ☐ PreventiveOncology

- NewRadiationModalities
  - ☐ Protons therapy
  - ☐ Neutrontherapy
  - ☐ Pionstherapy
  - ☐ High energyheavyions(Carbonandothers)therapy
  - ☐ Hyperthermia

➢ **Recent advances and developments in the discipline.**

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21-ANAESTHESIOLOGY

1. Basic Sciences as Applied to Anaesthesiology including Anatomy, Physiology,Biochemistry,PharmacologyandPhysics,Chemistry.
2. PrinciplesandpracticeofAnaesthesiaandanalgesiawithAnaestheticManagement. Clinical Science in relation to Anaesthesiology(This will includeessentialsof Internal Medicineand Surgery.
3. Pre-anaestheticevaluation,treatmentandAnaestheticimplicationsofconcurrent diseases, Anaesthetic Complications, Post-operative management,Post Anaesthesia careunit.
4. Specialitiesof:
   - PaediatricAnaesthesia.
   - Cardio-VascularandthoracicAnaesthesia.
   - NeurosurgicalAnaesthesia.
   - GeneralandOrthopaedicSurgery,MinimalInvasiveSurgery,DayCareSurgery.
   - E.N.T., Ophthalmic Surgery,DentalSurgery, AnaesthesiaforNeurologicaland Psychiatric diseases.
   - Obstetrics&Gynaecology,LabourAnalgesia.
   - GeriatricAnaesthesiaandothers.
5. RegionalAnaesthesia.
6. Anaesthesiafororgantransplantation,LaserSurgery,EndocsopicSurgery.Anaesthesiaoutside the operating room.
7. AnaesthesiologyandPainmanagement,CriticalCareMedicine,Ventilators,Polytrauma, DiasaterMedicine.
8. MonitoringinAnaesthesiology.UseofElectronicsandComputerdevicesinAnaesthesia.Awarenessduring Anaesthesia.
9. RecentAdvancesandcurrentconceptsinAnaesthesiaandAnalgesia.
10. MedicolegalaspectsinrelationtoAnaesthesiology.Anaesthesiarecordkeeping andqualityassurance.
11. BasicandadvancedLifeSupports.

12. BasicsofResearchmethodologyandstatistics.

- **Recent advances and developments in the discipline.**

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22-PHYSICALMEDICINE&REHABILITATION

Unit: I

- BasicAnatomyandPhysiologyofthe Musculoskeletal (includingBiomechanics), Urogenital, Cardio- pulmonary and nervous systems,etc.
- BasicPathologicalprocessescausingdiseasesanddisabilities,healingetc.
- BasicprinciplesofPharmacologyasappliedtotheconditionsencounteredin PhysicalMedicineand Rehabilitation.
- Philosophy, history, scope and need of Physical Medicine and Rehabilitation.
- Basic concepts in Physical Medicine and Rehabilitation-definitions,rehabilitation team, team members, scope, role and responsibilities ofdifferent membersetc.
- Organisation and Administration of Physical Medicine and RehabilitationServices.
- Disabilityprocess.Impairment,disability,InternationalClassifications.
- DisabilityPrevention-levelsandexamples.

Unit:II

- BasicsofbiochemicalaspectsofCalciumandVit.Dmetabolism,osteoporosis,diabetesmellitusetc.
- Basic principles of diagnostic modalities as applied to PhysicalMedicineand Rehabilitation (Laboratory,radiological etc.)
- Principlesofevaluationandrehabilitationmanagementofsocialproblems.
- Principlesofevaluationandrehabilitationmanagementofvocationalproblems.
- GaitAnalysis-Terminology,types,ClinicalApplications.
- Electrodiagnostic Medicine - basic principles, clinical methods,interpretation etc.
- OutcomeMeasuresinPhysicalMedicineandRehabilitation.
- ImpairmentRatingandDisabilityEvaluation.
- CommunitybasedRehabilitation.
- RehabilitationNursing,Principalandmanagement.

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Unit:III

- Therapeuticexercises-principles,types,indications,contraindications.
- Physical agents/modalities - principles, types,indications, contra-indications,precautions.
- Manipulation,traction,massage-principles,types,indications,contra-indications,precautions.
- Electrical stimulation-principles, types, indications, contra-indications,precautions.

Unit: IV

- PrinciplesandscopeofOccupationalTherapy.
- RationaleofA.D.L.(ActivitiesofDailyLiving)invariousconditions.
- IntegrativeMedicineandPhysicalMedicineandRehabilitation.
- Mobilityaids,wheelchairsandseatingsystems.

Unit: V

- Upper limb orthotic devices including splints– principles, types,materials andindications.
- Lowerlimborthoticdevicesincludingfootwearmodifications– principles,types,materialsandindications.
- Spinalorthoses–principles,types,materialsandindications.
- Upperlimbprostheticsandamputeerehabilitation.
- Lowerlimbprostheticsandamputeerehabilitation.

Unit: VI

- LowbackpainandPhysicalMedicineandRehabilitation.
- Neckpain and shoulderpain.
- Variousmusculoskeletaldisorders,evaluation,diagnosis,managementandrehabilitation in Physical MedicineandRehabilitation.
- Pain(acute/chronic),pathophysiology,pathway,evaluation,managementand Rehabilitation.

Unit: VII

- Holisticmanagementand Rehabilitationofpersons suffering from :Arthritis, including Rheumatoid Arthritis,Osteoarthritis, AnkylosingSpondylitisetc.Spinaldeformity,Osteoporosis,BurnsInjury,Haemophilia.

Unit:VIII

- SpinalCordInjury(traumaticandnon-traumatic),Etiology,Pathophysiology,Mechanism of injury, Radiology imaging, Evaluation, Various acute/chroniccomplicationsandtheirmanagement/Rehab.ManagementRehabilitation.

Unit: IX

- Varioustypesofwounds,theirmanagementandrehabilitations.
- Rehabilitationofpersonswith:-Obesity,dyslipidemiaetc.

-Afterarthroplasty,afterPOPcast,fracturetreatment,surgicalintervention.

- Principles ofSports Medicine,diagnosis, evaluation, prevention,

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and
management of sportsinjuries.

- Basic principles of rehabilitative surgeries such as deformity correction inpoliomyelitis,cerebralpalsy,clubfoot,contractures,revisionofamputationstump,pressure sore,tendontransfersetc.

Unit :X

- Variousjointand softtissueinjectionstechniques (withorwithoutimageguided) in Physical medicine and Rehabilitations, Indications/contraindicationsPrinciples,Procedures,Advantage/disadvantage, Rationaleofprocedure.
- VariousnerveblocksandmyoneuralblocksinRehabilitationMedicine.
- BotulinuminjectioninRehabilitationMedicine.
- VariousplastertechniquesinPMR.

Unit: XI

- ☐ HolisticRehabilitationofpersonssuffering from :Plexus orNerve Injury,TraumaticBrainInjury,Stroke, Parkinsonism, Multiplesclerosis, Ataxia, andothermovementdisorders,neurodegenerativedisorders,Epilepsy,Autonomicdisordersetc.,Neuropathy,Bell'sPalsyetc.,Hansen'sDisease,DiseasesofMuscle se.g.myopathy,motor-neurondisease,myastheniagravisetc.,CerebralPalsy,Spasticity,Poliomyelitisanditssequelae,CardiovascularDiseasee.g.CAD, MI,CABGSurgery,Angioplasty,Cardiactransplantationetc.,Peripheralvascular disease, Pulmonary Disease e.g. COPD, Bronchiectesis, Cystic fibrosisetc.,Obstetricsandgynaecologicaldisorders,Cancer,Swallowingdisorder,Bladder dysfunction, Bowel dysfunction, Vertigo, HIV/AIDS, Chronic Pain,Neuraltubedefects likemeningomyeloceleand hydrocephalusetc.

Unit: XII

- ☐ PediatricRehabilitationincludingchildrenwithAutismSpectrumDisorders,learning disabilities,multipledisabilitiesetc.
- ☐ GeriatricRehabilitation.
- ☐ Principles of evaluation and rehabilitation management of persons with :Visual impairment, Mental retardation, Hearing/speech impairment,Psychologicalproblemsormental illness.

Unit:XIII

- ☐ Medical/SurgicalEmergenciesinPhysicalMedicineandRehabilitation
- ☐ SexualityandDisability
- ☐ Rehabilitationofpersons:AfterOrganTransplantation,InICUsetting.

Unit: XIV

- Evidence-basedMedicineandPhysicalMedicineandRehabilitation.
- Legislationinrelationstodisability-NationalandInternational.
- Functional evaluation, Impairment rating, disability evaluation and certificationincludingguidelinesfor these
- SchemesandBenefitsextendedtopersonswithdisabilitiesbytheGovt.

Unit: XV

- Barrier-freeEnvironmentandaccessrelatedissues.
- ComputersinPhysicalMedicineandRehabilitation.
- AssistiveTechnologyrelatedtoPhysicalMedicineandRehabilitation.

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- RecentAdvancesrelatedtoPhysicalMedicineandRehabilitation.
- Ethicalaspectsinrehabilitation.
- Researchmethodology

➢ **Recent advances and developments in the discipline.**

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23-DENTISTRY

Unit-I-Anatomy:
- Detailed Anatomy&OsteologyofHead& Neck.
- Studyof cranial nerves–in detail extracranialcourse5th, 7th

Unit-II-Biochemistry:
- BiochemistryappliedtoDentalScience.
- Basicchemistry&fateofhaemoglobin,bloodgroups,WBCtypes,number,variations,function,formation, circulation.
- Vitamins.

Unit-III-Physiology:
- Pituitarygland -Hormones,actions& abnormalfunction.
- Inflammation-Acute &chronicinflammation,repairofwound.
- Hemorrhage,Shock,Syncope.
- Circulatorydisturbance &Hypertension.
- Medicalemergenciesin Dentalpractice.
- Congenital&rheumaticheartdisease.
- Anaemia,coagulationdefects,bleedingdiseases.
- Allergy, Drugreactions.

Unit-IV– Microbiology:

- IntroductiontoBacteriologywithspecialreferencetomedical&DentalBacteriology .
- Immunity&immunizingagents.

Unit-V-Pharmacology:

- CardiovascularDrugs -Vasopressor agents&treatmentofshock.
- Drugsactingonblood -anticoagulants,coagulants&hematinic.
- Antiseptics,astringents.
- Antibiotics&Anti-inflammatory.

Unit-VI–Prosthodontics:

- Principlesandtechniques ofimpression making in Complete Dentures, RPD & FPD.Principleofretention& stability.
- JawRelations&methodsofregistration.
- Processing&finishingofCompleteDentures.
- Immediatecomplete&partialdentures.
- Componentsof removablepartial denture&theirfunctions.
- Surveyors&mouthpreparation.
- Designingofremovablepartialdentures.
- Acrylicpartialdenture.
- Principleof tooth reduction.
- SurgicalRetractors.
- Selectionandfabricationofpontic&retainer.
- Aims&scopeof thescienceof Dentalmaterials.
- Important physical properties applicable to Dental Materials including their biologicalconsiderations.

Unit-VII-Conservative Dentistry&Endodontics:

- Fillingmaterialsbothadults&children.
- Rationale,care&sterilization ofEndodonticinstruments.
- Treatmentofvital &nonvitalpulpSurgicaltreatmentinendodontics.
- Bleachingofteeth.

Unit-VIII-Oral Surgery:

- LocalAnaestheticDrugs
- UsesofAntibioticsinOralsurgery.
- OpenandClosedReductionofFractures.
- DentalImpaction.
- DentalImplants.
- Impactedteeth&fractureofjaws.
- OralSurgicalComplications&theirmanagement.

Unit-IX-Oral Medicine, Radiology&Oral Pathology:

- Salivaryglands anditsDiseases.
- DentalAnatomy.
- Developmentaldisturbancesoforalstructures.
- Osteomyelitis.
- Dentalcaries&sequelae.

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- Enamel,Dentin, Pulp, Cementum,PDL&bone.
- BacterialandFungal Infection.
- AIDS.
- Basicsoforalradiology.
- Effectsofnutritionaldisturbances oforal structures.
- OralMucousMembrane.
- Infectionsoforal&para oralstructures.
- Cysts&Neoplasmsoforalcavity.
- Precancerouslesions& etiology,pathology&treatment.
- TMJdiseases&management
- Effectsofradiationonoral &paraoralstructures.
- Oralmicrobiology.
- Blooddyscrasias&their management.
- Forensicodontology.
- Impactedteeth&fractureofjaws.
- OralSurgicalComplications&theirmanagement.

Unit-X-Orthodontics:

- Normalocclusion&itscharacteristics.
- Malocclusion-Type,classification&etiology.

Unit-XI–Pedodontics:

- DevelopmentofJaws and its growth.Developmentofteeth and surrounding structuresandcalcification (including Theories) ofhardtissues.
- Eruptionandsheddingof teeth.
- AgechangesinTeethassurroundingstonestructures.
- Psychology - Psychological development from birth to adolescence. Management ofchildin thedental office.
- TreatmentoftraumatizedTeeth.
- Mouthhabitsandtheirmanagement.
- Importanceoffirstpermanentmolarandsplints.

Unit-XII-PublicHealthDentistry:

- Normsforpotabilitypurificationofwater anddisposal ofwastes.
- Introductiondefination, objectivesandfunctionsofpublicHealthdentist.
- Schoolanddentalpublic healthprogramme.
- EthicsinDentalCouncilofIndia. IndiansDental Association.

Unit-XIII-Periodontics:

- ClassificationofgingivalandPeriodontaldisturbances.
- Gingivalenlargement.
- Localand systemicfactorsin the causationofgingival and periodontallesions.
- Periodontitisandsequelae.
- Prognosis and Treatment of all gingival and periodontal. distrubances. Treatmentplanning,phasesandrationale.DifferentavailableTherapeuticmeasures. PreventivePeriodontics,Conceptoffocalinfections

- **Recent advances and developments in the discipline.**

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24- BLOOD BANK

I. **HISTORYOFTRANSFUSIONMEDICINE**
- Scientificlandmarksinitsdevelopment
- Impactofworldwarsonitsdevelopment
- DevelopmentofPVCbags.

II. **SCIENTIFICBASISOFTRANSFUSION**

A. Biochemistry&physiologyofelementsofblood
- Processofcellproductionandlifespan
- redcells
- whitebloodcells
- platelets
- Redcells
- Hemoglobinstructure&function
- Metabolicpathways
- Membranestructure&function
- Whitecells
- Structure,function&kinetics
- Platelets
- Structure,function&kinetics
- Physiologyofhaemostasis
- Roleofplatelets
- Coagulationpathways
- Fibrinolysis

Hemodynamicsofbloodflow&volume
Ironmetabolism
Bilirubinmetabolism

B. Immunology
Principlesofbasicimmunology
- Antigen,antibody,complement,immunoglobulin
- Antigenantibodyreaction
- Lymphocytesinhumoral&cellularimmunity

RoleofhybridomatechnologyinImmunohematology
Immunologyoftransplantation
HLAandgeneticcontrolofimmuneresponse

C. *Genetics*
Principlesofbasicgenetics
11. Geneticsofbloodgroups
- Phenotype&genotype
- Principlesofbloodgroupinheritance
- Populationgeneticsofbloodgroups

III. ANTIGENSYSTEMSINFORMEDELEMENTSOF

Redcellantigens
Leucocyteantigens
Plateletantigens

IV. BLOODCOLLECTION,PROCESSING,COMPONENTPREPARATION

A. Managementofblooddonation

Donorrecruitment
- Voluntaryblooddonationsystems
- Categoriesofblooddonors
- Education,awareness&informationofprospectivedonor
- UseofInformationTechnologyfordonorrecruitment
- Donorinformationprogrammes

Acceptabilitycriteriaofblooddonor
Careofblooddonor
- Pre-donation
- Mid-donation
- Post-donation
- Prevention&managementofcomplicationsofblooddonation

Bloodcollection
- Anticoagulants&preservatives
- Procedure
- Blooddonationcamps

B. Bloodcomponents

Components
- Types
- Methodsofpreparation
- Indications,dosage&administration
- Leucodepletion
  - Variousmethods
  - Qualitycontrol

Storageofblood&components
Wholeblood
- Redcellconcentrate
- Plasma
- Granulocyte
- Cryoprecipitate
- Stemcells
  - Peripheralbloodstemcell
  - Cordblood
  - Dendriticcell

Plasmafractionation
- Viralinactivation
  - Singledonor
  - Pooling

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Newermethods

V. PRE–TRANSFUSIONTESTING

Compatibilitytesting
- ABOgrouping&Rhtyping
- Antibodyscreening
- Crossmatchingmethods
- Newermethodsofcrossmatching
  - Solidphase
  - Geltechnology

Screeningfortransfusiontransmittedinfections
- Methodology
- Nucleicacidamplificationtechniques
- Neweremergingpathogens

Selectionofblood,components&plasmaproductsfortransfusion

VI. ADVERSEEFFECTSWOFBLOODTRANSFUSION

Clinicalpresentation,pathophysiology,investigations,management
- Haemolytictransfusionreaction
- Non-Haemolytictransfusionreaction
- Allergic,anaphylactoidandanaphylacticreactions
- Alloimmunizationtovariouselementsofblood

Transfusiontransmittedinfections
- Bacterial
- Viral
- Parasitic

Transfusionassociatedgraftversushostdisease

Transfusionrelatedacutelunginjury

Others
- Hemosiderosis
- Volumeoverload
- Posttransfusionpurpura

VII. APHERESIS

Technologyofapheresis,variousequipment&disposables

Haemapheresis(platelets,granulocytes,plasma,stemcells)
- Donorselection
- Procedure
- Complications

Therapeuticapheresis
- Indication,procedure&complications
- Plasmaexchange,redcellexchange
- Newermethodsforimmunoadsorption

VIII. Autologoustransfusion

Basicprinciples,indication&contraindications

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Pre-deposit
Haemodilution
Intraoperativebloodsalvageincludingequipment
Post-operativebloodsalvage
Directeddonation

IX. ANTENATALANDNEONATALTRANSFUSIONPRACTICE

Pathophysiology,diagnosis&management
Rhincompatibility
ABO&otherbloodgroupincompatibility

Exchangetransfusion
Indications,methodology&complications

Neonataltransfusionpractice
Strategiestoreducedonorexposure
Organiseddonorselection
Intrauterinetransfusion

X. IMMUNOHAEMATOLOGY

Classification,diagnosis&management
Immunehemolyticanemia
Immunethrombocytopenia
Immuneneutropenia

Immunohaematologicalproblemsinmultitransfusedpatients.

XI. HEMOTHERAPY

Pathophysiology,diagnosis&managementofanemia
Anemia
Irondeficiencyanemia
Megaloblasticanemia
Aplasticanemia
Anemiaofchronicdiseases
Neonatalanemia
Hereditaryanemia
Thalassemia
Sicklecellanemia
Enzymopathy
Others

Pathophysiology,diagnosisandmanagementofhemostaticdisorders
Hemophilia44.2VonWillebranddisease
Plateletdisorders
Qualitativedisorders
Quantitativedisorders
DIC/TTP/HIT
Acquireddisorders
Others

Pathophysiology,diagnosisandtransfusionsupportinacutebloodloss

Shock
Massivetransfusion

Transfusionsupportinsurgery
Generalsurgery
Specialisedsurgery–Cardiopulmonarybypass/hemodialysis

Classification,diagnosis&transfusionsupportinoncology
Hemopoieticmalignancy
Non-hemopoieticmalignancy

XII. TRANSPLANTATION

Transfusionsupportintransplantation
Stemcelltransplantation
Harvesting
Cryopreservation
CD34counting&qualitycontrol
Infusion
Bonemarrowtransplantation
Harvesting
Processing
ImmunohaematologicalproblemsinABOmismatchedBMT
TransfusionsupportBMTpatients
Transfusionsupportinspecializedconditions
Renaltransplantation
Livertransplantation
Others

Irradiationofbloodproducts
Indications,dosage,adverseeffects

Tissuecentre
Cordbloodcentre

XIII. BLOODSUBSTITUTESANDHEMOPOIETICAGENTS

Crystalloids&colloids
Oxygencarryingcompounds
Useofhematinics
Hemopoieticgrowthfactors
Plasmaproducts

XIV. MEDICOLEGALCONSIDERATIONSINTRANSFUSIONMEDICINE

Ethicalandlegalconsiderationspertainingtotransfusionpractice
Identificationofbloodstains
Paternitytesting
Donornotification&counselling
Lookbackprogramme
Drugs&CosmeticsAct,Accreditation
ConsumerprotectionAct
Others

XV. TOTALQUALITYMANAGEMENT

DevelopmentofStandardOperatingProcedures(SOP)manual.

Qualitycontrol
Reagents&diagnostickits
Instruments
Personnel
Blood&components

Qualityassurance
Internalqualitycontrol
Externalqualitycontrol

Proficiencytesting
HospitalTransfusionCommittee
Medicalaudit
Turnaroundtime
ISOcertification/GMP

XVI. ORGANIZATION&MANAGEMENTOFTRANSFUSIONSERVICES

Organisation&functionofbloodservices&hospitaltransfusionpractice
Recruitment&motivation
Operationofbloodmobile
Developmentoftransfusionservice
Inventorycontrol
Developmentofforms,labels,records,etc.

XVII. BIOSAFETY

Personnel
Laboratory
Equipment
Sterilization
Disposalofwastematerial

XVIII. MODERNBIOLOGICALTECHNIQUES

Principle,methods,relevanceintransfusionmedicine
Westernblot
Polymerasechainreaction
SSCP
SSOP
Dotblothybridization
Others–Animalexperiments,museumtechniques
Microarrays
Proteomics
OthernewtechniqueinTransfusionmedicine

XIX. AUTOMATION&COMPUTERISATION

Instrumentation
Automatedbloodgroup&processing
Automatedinfectiousscreening
Useofbarcodes
Useofcomputer
Laboratoryandhospitalinformationsystem

- **Recent advances and developments in the discipline.**

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25- HOSPITAL ADMINISTRATION

I -GeneralAdministrationandManagement

Sl	Topic	Contents
1.	Development ofManagementCo ncept	• HistoryandgrowthofManagementscience • Traditionalvs.modernmanagement • Evolutionofmanagementtheory • Managementasaprofession • Ethicsinmanagement
2.	ManagementFunct ion&Tools	• Managementlevelsandskills • Functions&Principlesofmanagement • Challengestoamanager • SystemsApproach • Roleoftheexecutive • Managementtools • Stylesofmanagement • Committees
3.	Fundamentals ofPlanningandDec ision Making	• HierarchyandTypesofPlans • Stepsinplanning • Managerialdecisionmaking
4.	OrganisationStruc ture	• Organisationaldesignandfunction • HospitalOrganisation • Matchingstructureandstrategy • Functionalorganization • Lineandstaffauthority • Delegation/Decentralisation
5.	Officeprocedure andDisciplinaryp roceedings	• DefinitionofOffice&officeprocedures • Draftingofficialletters • Servicerules&procedure • Conductrules • Disciplinaryproceedings
6.	Communication	• Basicconcepts • Typesofcommunication • Barriersofcommunication • Principlesofgoodcommunication • CommunicationinHealthcare

7.	PersonnelManagement &Human ResourceDevelopment	• Definition&Importance • Workstudy&Methodstudy • Manpowerplanning • Recruitment&selection • Jobanalysis • Jobdescription • Jobevaluation • Jobenrichment • Training&development • PerformanceAppraisal • GrievanceRedressal • Absenteeism
8.	OrganisationalBehaviorandGroupDynamics	• Basicsofsociology,anthropology,psychology • Characteristicsofworkgroups • OBlabs • Dynamicsoforganizationalbehavior • Motivation&Leadership • Conflictmanagement • Transactionalanalysis • Teambuilding • ChangeManagement • JohariWindow • Grievanceredressalsystems
9.	FinancialManagement	• GDP,GNP,NationalEconomicPolicies • Budgeting,typesofbudget • WorkingCapital,Cashflowanalysis • FinancialStatementandRatios • BalanceSheets • Elementsofcost,costaccounting • FixedassetsandDepreciation • Breakevenanalysis,Costeffectiveness,Costbenefitanalysis • FinancialManagementinhospitals • Costcontainmentinhospitals
10.	MaterialManagement	• ImportanceofMaterialManagement • TheoryofDemandandSupply • Inventorycontrol • Purchasecycle • TenderSystem • Economicorderquantity,Safetystock,Leadtime • ReceiptandInspectionofStores • Distribution,Standardisation,Codification • CondemnationandDisposal • Storesdocumentation • Equipmentaudit • LogisticsandSupplychainmanagement • RoleofcomputersinStoresManagement
11.	RiskManagement	• Ergonomicsanditsapplicationinhospitals • Occupationalhazards • WorkmanCompensationAct • Definition,scopeandimportanceofindustrialrelations

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12.	InformationSystem	• Informationsystemanalysisanddesign • HMISatooltomanagerialcontrol
13.	Modern ManagementTechniques	• QuantitativemethodsofManagement • ORtechniquesandtheirapplicationinhealthcare • Managementbyobjective
14.	MarketingManagement	• ConceptofMarketing • Marketingstrategies,evaluationandcontrol • MarketingInformation&research • Market&medicalethics • SocialAspectsofmarketing • PrivatizationofHealth • PublicPrivatePartnership(PPP) • Outsourcing • MedicalTourism • CorporateSocialResponsibility

II -HealthcareandHealthAdministration

Sl	**Topic**	**Contents**
1.	Development ofHealth ServicesinIndia	• Evaluationofhealthcareservices • Definition&dimensionsofhealth • ReviewofdifferentreportsonHealthcare
2.	MedicalSociology	• SociologicalperspectivesofHealth,illnessandhealing
3.	Health&Disease	• Conceptofhealth&disease • Conceptofwellbeing • Naturalhistoryofdiseaseandroleofhospitalsinvariouslevelsof prevention
4.	ResearchMethodology inHealthandHospitalAdministration	• Conceptofhealthindicators • Typesofsurveys • Selectingaproblem,makinghypothesis • ResearchProtocolwriting • Determiningobjectives • Bibliographicaldata • Samplesizedetermination • Datacollectiontechniquesandtools • QuestionnairesandInterviewtechniques • Observationtechnique • Analysisofdata • Reportwriting • ErrorsofMeasurement
5.	NationalHealthPolicy	• NationalHealthPolicy–2017 • RoleofHealtheducationandcommunication • HealthCommittees • NationalHealthProgrammes • MillenniumDevelopmentalGoalsandSustainabledevelopmentgoals

6.	Biostatistics	• ConceptofBiostatistics • Presentationofdata • Frequencyofdistribution • Measurementsofcentraltendency • Measurementofdispersion • Sampling&Samplingerror • Testingofhypothesis • Testofsignificance
7.	Epidemiology	• Evolutionandusesofepidemiology • Definitionsandterminology • Naturalhistoryofdiseaseandroleofhospitalinvariouslevelsofpreventions • Typesofepidemiology • Methodsofepidemiologicalstudies • Socio-economicstatusandoccupationasdeterminant indiseasedistribution • Causeandeffectrelationship • Epidemiologyofhospitalinfection • Epidemiologyof • Non-Communicablediseases • TraumaandRTA • Diabetes • CoronaryArteryDisease(CAD) • Howtoinvestigateanepidemicandroleofthehospitalinitscontrol • CommondiseasesinIndia-theirepidemiologyandprevention
		• Screeningandsurveys • ConceptofhealthIndicators • Disabilityadjustedlifeyears(DALY's) • Qualityadjustedlifeyears(QALY's) • Disabilityadjustedlifeexpectancy(DALE) • PhysicalqualityoflifeIndex(PQLI)etc
8.	HealthStatistics andHealth InformationSysteminIndia	• Need • Commonrates&ratio • Incidence&prevalenceratesand • Morbidity • Mortality • Healthreports • NotifiableDiseases • HealthcareDeliverysystem • ICD-10&ICD–11
9.	HospitalUtilization Statistics	• CommunityIndices:Bedpopulationratio,Hospital admissionrate,PercapitaHospitalisation rate • Hospital utilisation Indices: Average daily census, Bedoccupancyrate,bedturnoverrate,bedturnoverinterval,Averagelengthof stay
10.	MedicalRecords	• Definition,historicalbackground,typesofmedicalrecords,retention of records, computerisation of medical records,medicalrecord

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		audit,MRDepartment
11.	HealthEconomics	• Basicsofhealtheconomics • Analysisofdemandandsupply • HealthInsuranceSchemesandsocial • SecurityschemelikeCGHS,ESIinIndia • Medicalcaresystem&Health • InsuranceSystemindifferentcountries
12.	PopulationDynamics	• Demographyandfamilyplanning
13.	EthicsLawsandActs	• CodeofMedicalEthicsanddutiesofphysicians • LegalissuesinHospitaladministration • LawsandActsapplicabletohospitals • MedicolegalCases • Industrialrelationsandlaws • Patient'srights&provider'sresponsibility-MedicalMalpractice • Medicalethicsandethicalissuesinendoflifedecisions • DyingDeclaration • Importance(section32&157)ofIndianEvidence ActandDeathCertificate-

lll -HospitalPlanningandHospitalAdministration

Sl	Topic	Contents
1.	Hospital	• Historyanddevelopmentofhospitals • Definition,types,control,roleandfunctions • HospitalsinIndiatoday,theirnumber,types,size,distribution, ownership,utilization,issues&trends
2.	NursingAdministration	• IntroductiontoNursingprofession • Nursingorganizationstructure • Nurseasasocialandprofessionalentity • Staffingnormsinvarioustypesofhospitalsanddifferentdepartments. • Recenttrendsinnursingprofessionandnursing
3.	PublicRelationsin Hospital	• Publicrelations
4.	EmployeesWelfare	• Welfareschemes • Occupationalsafety • Conflictmanagement • Stressmanagement • Counseling

5.	QualityinHealthServices	• Qualityconcept • Verifiablestandardsandparameter • VariousQualityModels • TotalQualitymanagement • Kaizen • Leanmanagement • SixSigmainhealthcare • HospitalandHealthcareAccreditation
6.	FutureofHospitalAdministration	• PerformanceReview • Hospitalstatistics&qualitycontrol • Recenttrendsinhospital • Challengestoadministrators • Reengineering • Telemedicine • Artificialintelligence
7.	Hospital Planning-Generalconsideration	• ChangingsystemofHealthServicesconceptinplanning,designingandspace • Sitesurveysforplanningahospital • Planningforhospitalsmacroandmicroaspects • Hospitalbuildinganoverview • Externalarchitecturalaspectsandlandscaping • Internalarrangements • Hospitalhygieneandsanitation • Lighting&HVAC • DesignconsiderationsincludingevidencebaseddesignandArchitectBrief • Planninganddesigningspecialisedhospitals • TakingoverandcommissioninganewhospitalAlterationandadditionsinanexistinghospital • PlanningtheHospitalEngineeringServices • Repairandmaintenanceschedule • Equipmentplanningforanewhospital • Greenbuildings

IV. AdministrationofClinicalandNonClinicalServicesandAdministrativeProcedures

	Topic	Contents
1.	ClinicalServices	☐ Outpatientservices ☐ Surgicalservices ☐ Operatingdepartment ☐ Paediatricservices ☐ Dentalservices&Maxillo-facialSurgery ☐ Psychiatricservices ☐ Radiodiagnosis ☐ Radiotherapyservices ☐ AccidentandEmergencyservices ☐ HospitalLaboratoryservices ☐ ObstetricsandGynecologyservices ☐ Intensivecareunit ☐ Dialysisunit ☐ Daycareunits ☐ Bonemarrowtransplantunit(BMT) ☐ Nuclearmedicine ☐ Lithotripsycentre ☐ Physiotherapycentre ☐ Burnscentre ☐ MalignantDiseasesTreatmentCentre ☐ Traumacentre ☐ Geriatricservices ☐ AntibioticPolicy ☐ StandardPrecautions ☐ SpillManagement ☐ Occupationalhazardsandsafetyinhealthcare

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	Non-Clinicalservices andAdministra-tiveprocedure	• Enquiry&registration • Admissionoffice • Inspection,MedicalSuperintendent'srounds • HospitalStandingOrders • HospitalWelfareServices • IndianRedCrosssocietyandhospitals • Nursingservices • Wardmanagementincludingwelfareandrecreationalfacilities • House-keepingincludingPestcontrol • MedicalstoresandPharmacyservices • BloodBankandTransfusion-services • CentralSterileSupplyDepartment(CSSD) • Dietaryservice • Linenandlaundryservices • Hospitalengineeringservices • FireFightingservices • Ambulanceservices • Fataldocuments • Mortuary • Equipmentmanagement • Transportationinhospitals(Intramural,Extramural) • Biomedicalwastemanagement • Solidwastemanagement • HospitalInformationsystem(HIS) • Structuralrequirementforinfectioncontrolinhospitals • Hospitalformulary • Essentialdrugslist(EDL) • Patientfeedback&Dischargeprocedure • DisasterManagement
		• FireSafetyinHospitals • HospitalSafetyandSecurity • EnterpriseResourcePlanning(ERP) • HospitalMediaRelations&MarketingNon–ProfitOrganizations

- **Recent advances and developments in the discipline.**

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26- MEDICAL RECORD OFFICER

A. ANATOMY

1. General Introduction
   - Definition of Anatomy & Physiology
   -Types of Anatomy (including systemic)
   -Definition of topographic term/term used to describe the body
   -Description of various regions of the body
2. Cells and tissues of body and general histology
3. Anatomical description of the following
   - Skin and Breast -Lymphatic system
   -Osteology -Blood and blood forming organs
   -Joints -Urogenital system
   -Ligaments -Endocrine system
   -Fasciae and Bursae - Organs of special senses
   -Musculoskeletal system - Digestive system
   -Cardiovascular system -Embryology
   -Respiratory system

B. PHYSIOLOGY

1. Introductory lectures on specialization of tissues
2. Homeostasis and its importance in mammals
3. Blood and lymphatic system
4. Cardiovascular system
5. Excretory system, skin and temperature regulation
6. Respiratory system
7. Digestive system and metabolism
8. Endocrinology
9. Reproductive system
10. Nervous system
11. Special senses
12. Muscles

C. PATHOLOGY:

1. Introductionofclinicalpathology,definitionandclassificationofdiseases.
2. Classificationofvarioustypesofclinicallesions/tumors(Benignandmalignant).

D.MICROBIOLOGY:

1. Introductiontosubjectofmicrobiology.
2. Modesoftransmissionofdiseases.
3. Principleofimmunediagnosis.
4. PrinciplesofLabdiagnosisofbacterialinfection,parasiticinfection,viralandfungalinfection.

E. BIOCHEMISTRY:

1. Definitionofbiochemistry.
2. Elementaryideas/overviewofthefollowing:Sugar,proteinsan

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dlipidsandtheirmetabolism

3. ConstituentsinbloodincludingenzymesandtheirvariationindiseasesCompositionofCSFasciticfluidandpleuralfluidindiseases
4. FunctionaltestlikeLFT,GTT,AHTandclearancetestsforkidneyFunctiontests.
5. InvestigationslikeRadio-activeiodineuptake,Radio-immuno-assay,proteinboundiodineandPH2,PO2andPCO2.
6. Basic knowledgeof vitamindeficiency diseases and endocrine diseasesNormaland abnormalconstituentsofurine
7.

F. MEDICALCODING

i. Meaninganddefinitionofcoding.
ii. StructureofICD10th,volume1st,2nd,3rd.
iii. ProperuseofindexDifferencebetweenICD9thand10th.
iv. Familyofclassificationandhealthclassifications.
v. HistoryofdevelopmentofICD.
vi. Rulesformortalitycodingandmorbiditycoding.

G. MEDICALTERMINOLOGY

1. Definition,objectivesandvaluesofmedicalterminology
2. Colorssymbols,numeralsetc.
3. Prefixessuffixesandroots
4. Originoftermsanatomicaldiagnosticoperativeradiologyandclinicaltermsandabbreviationinrespectofthefollowing Musculoskeletalsystem,integumentarysystem,CirculatoryandlymphaticsystemandRespiratorysystem,digestivesystem,Genitourinary,Endocrinesystem,Neurologicalandpsychiatricdisorders,Obsteriousand gynecology andspecialsenses(eyeandear).

Meaning & Definition of Coding
Structure of ICD -10
Structure of Volume-I
Structure of Volume-II
-Dual codes for dagger & Asterisk
-Conventions used in ICD-10
-Proper use of the index
(How to use coding books)
Structure of Volume -III
Difference between ICD-9th and ICD- 10th revision
Family of classification
- Internal classification of Functioning,
Disability and Health (ICF)
Rules for mortality coding
-Modification rules
Rules for Morbidity Coding
Coding Rules Summary
Coding exercises
Summary of ICD-10 Coding Notes
History of development of ICD
ICF - Introduction
Internal classification of Functioning.
Disability and Health (ICF)

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Brief history of Medical Record.
Definition of Medical Record.
Characteristics of Medical Record.
Values of Medical Record.
Contents and components of Medical Record.
Need for the Medical Record Department and its functions.
Responsibility for Medical Record, Hospital Hospital Administrator, Doctors, Nurses, Para-Medicals.
Organisation and management of Medical Record Department, Medical Record Committees, Medical Audit Committees.
Origin and development of Medical Record including organisation of admission office.
Control and quantitative and qualitative analysis of discharged inpatients records.
Numbering, filling retrieval and storing of records.
Indexes and Indexing control.
Legal aspects of Medical Records.

Introduction,Legalprocedures,medicallawandethicsidentification, medicalautopsy,deathandpostmortemchangeexternalandcauses,effects andmedico legalaspect(casestudies).

Retention, preservation and destruction of Medical Records.
Organisation of outpatients Medical Record Services.

HOSPITALADMINISTRATION

1. Definition,functionsandtypesofhospitals.
2. Functionofmanagement(POSDCORB).
3. Introductionofvarioushospitalservices,i.e.(patientcareservices,supportiveservices,peri-institutionalservicesandcommunityservices).

GENERAL STATISTICS FOR MEDICAL RECORD OFFICER

1. Introduction to statistics.
2. Methods of collection of data
3. Measures of central tendency(simple average, G.M, H.M, Mode and Median).
4. Measures of Dispersion(standard deviation, range, variance, average deviation).
5. Sampling: Definition, methods of sampling
(Random, Systematic, Stratified, Cluster).
6. Correlation and regression: Significance, linear correlation, correlation coefficient and linear regression.
7. Time series analysis-concept and it's utility, component of time series.
8. Test of significance .
9. Graphical presentation of data.
10. Probability-concept and definition .
11. Uses of statistics.

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27- LIBRARIAN

PAPER-1.: GENERAL STUDIES MENTAL ABILITY

1. General Science – Contemporary developments in Science and Technology and their implications including matters of every day observation and experience, as may be expected of a well-educated person who has not made a special study of any scientific discipline.

2. Current events of national and international importance.

3. History of India – emphasis will be on broad general understanding of the subject in its social, economic, cultural and political aspects with a focus on AP Indian National
Movement.

4. World Geography and Geography of India with a focus on AP.
5. Indian polity and Economy – including the country's political system- rural development – Planning and economic reforms in India.
6. Mental ability reasoning and inferences

LIBRARY, INFORMATION AND SOCIETY

Philosophy and Ethics of Librarianship. Ancient and Modern Libraries. Library as a Social Institution: Functions of the Library. Role of the Library in Formal and Informal Education. User Studies and User Education.

Professional Education and Librarianship. Library Education in India.
Five Laws of Library Science.
Types of Libraries : National, Public, Academic, and Special. National Library, Kolkata; National Science Library; State Central Library.

Library Movement in India. Library Movement in Andhra Pradesh.
Library Cooperation / Resource sharing: Resource sharing programmes.
Library Consortia in India.
Professional Associations: IFLA, ALA, ILA, IASLIC, IATLIS, APLA, ALSD: Objectives, Functions, Activities.
Organizations: NASSDOC, DESIDOC, UNESCO, NISCAIR -- Objectives, Programmes and activities.

Legislation – Need, Purpose and Advantages.
Library Legislation in India. Detailed Study of A. P. Public Library Act. Overview of Library Acts in India.

Intellectual Property Rights(IPR). Copyright Act.

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Delivery of Books Act. UNESCO Public Library Manifesto.

Nature of Information:
o Data, Information & Knowledge.
o Information : Nature, Types, Characteristics, Properties, Use and Value.
o Information Explosion.
o Information Society.
o Information Science.
o Information Industry.

Information Communication:
o Information Cycle.
o Types of Communication, Communication Models (Theories).
o Scientific Communication.
o Formal and Informal Channels of Communication.
o Barriers of Communication of Information.
o Information Literacy

Economics of Information:
o Information needs. Information Seeking Behaviour.
o Marketing of Information.

Knowledge Management & Digital Library:
o Knowledge Management.
o Document Management.
o Content Management.
o Digital libraries; Institutional Repositories.
o e-learning.
o Virtual Library.

Informetrics:
o Citation: Citation Analysis.
o Librametry, Bibliometrics and Scientometrics, Webometrics.
o Bibliometric Laws. Zipf's Law, Bradford's Law, Lotka's Law.

LIBRARY CLASSIFICATION
Library Classification – Meaning, Need and purpose of classification.
Normative Principles.
Five Laws of Library Science.
Formation, Structure and Development of Subjects:

Brief study of major schemes viz: Decimal Classification (DC); Universal Decimal Classification (UDC).

General Theory of Classification. Ranganathan's contribution.
Main Class – Canonical Class and Basic Class.
Five Fundamental Categories : PMEST.
Isolates -- -- Common Isolates – Kinds of Common Isolates, Special Isolates, Auxiliary
Schedules.

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Principles of Helpful Sequence
Notation: Types
Canons for Classification
Call Number -- Class Number, Book Number – Types of Book Numbers, Collection Number.

LIBRARY CATALOGUING

Library Catalogue: Objectives and functions.
Types of Library Catalogues: Physical and Inner Forms
Different Types of Catalogue Entries and their Functions

Subject Cataloguing: Lists of Subject Headings – LCSH and SLSH
Centralised Cataloguing:
Union Catalogues: Definition, use and functions.
OPAC. Web Based Catalogues.
Use of Internet in Cataloguing.
OCLC and WorldCat.
Standardization in Cataloguing.
Standards -- ISBD (M), ISBD (S) and ISBD (G).
Filing and Arrangement of Catalogue Entries.

MANAGEMENT OF LIBRARY & INFORMATION CENTRES

Management:
Functions and Principles of Management and their applications in Libraries. Scientific Management.
Routine & workflow in different libraries / sections. Principles and theories of book selection.
Selection and Acquisition. Book Selection Tools.
Online Bookshops.
Technical Processing – Classification & Cataloguing.
Open Access Vs Closed Access. Principles of Stacking.
Circulation: Charging and discharging methods; Day-Book System, Ledger System, Browne System, Newark System, etc.

Library Buildings – Planning.
Reference & Information Services.
Serials Management. Methods of Recording. Problems in Serials Acquisition.
Methods of Stock verification.
Types of Library Records.
Library Statistics : Purpose and Types.
Types of Library Committees and their Functions.
Library Rules & Regulations.
Public Relations. Publicity & Extension Activities.
Schools of management. Management Styles.
Planning Library and Information Centres: Planning process,
SWOT Analysis.
Performance Evaluation of Library and Information Centres.
Management Information Systems (MIS).
Project Management, Organisational Planning.
Gantt Charts. PERT / CPM.

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Management by Objectives: (MbO):
Decision making: Decision Process.
Delegation of Authority:
Authority, Responsibility and Accountability – Guidelines and barriers.
Human Resource Management:
H R Planning, staffing, job analysis, job description, job evaluation, staff recruitment;
selection, training and development. Inter personal relations.
Motivation : Concept, Theories.
Management of Change: Impact, Strategies, Organisation Culture.
Financial Management:
Resource Mobilisation.
Budgeting Methods: PPBS and Zero-based. Budgetary Control.
Cost Effectiveness and Cost Benefit Analysis.
Cost Accounting: Concept and Use.
Outsourcing.
Quality Management:
Application in LICs. Quality Audit, Customer Satisfaction Vs Quality Management.
ISO-9000. TQM its Application in Libraries.

REFERENCE & INFORMATION SOURCES AND SERVICES

Reference Service:
Types of reference service – Ready Reference Service and Long Range Reference Service. Reference Process. Reference service vis-à-vis Information Service. Current Awareness Service, SDI and Referral service. Information Sources. Evaluation of reference sources.
Reference Sources:
Dictionaries, Encyclopedias, Almanacs, Yearbooks, Directories, Handbooks, Manuals,
News-Summaries, Concordances, Biographical, Geographical Information Sources, Electronic Resources
Bibliography:
General, Special, National (INB and BNB), Trade, subject. Preparation of bibliographies.
Bibliographic Control: UBC and UAP.
Abstracting Services: Types and Parts of an Abstract.
Indexing Services: Index, Indexing Services / Products – Citation Indexes.

INFORMATION TECHNOLOGY

Information Technology:
o Components of IT
o Hardware – Developments.
o Software – Operating Systems – Single User, Multi User. Types of Application Software.
o Client -- Server Technology: Different types of Servers.
Communication Technology:
o Telecommunications. Modem.
o Switching Systems: Circular, Message and PSS. Gateways, Ethernet, Hub/Switches.

o Communication Media.
o Bandwidth, Multiplexing.
o ISDN.

Electronic Information:

o Electronic / Digital Information.
o Digital Collection, Digital Rights Management.
o Digitization.
o Software & hardware used for digitization. Image Formats (JPEG, GIF / BMP). Audio Formats (MPEG, MP3, WAV). e-documents.
o Preservation and archiving of e-resources.
o Weblogs. Wikis, Wikipedia.

Communication Tools and Techniques:

o Fax, E-mail, Tele Conferencing, Video Conferencing, Voice Mail. Hyper Text and Hyper Media. List Serve / Electronic groups.
o Open Source and Proprietary Software.
o Digital Standards – Standards, Protocols and Formats. Interoperability.
o Wireless Communication: Networking, WAP / Wireless Internet, WLL, Cellular Communication.
o Data Communication Concepts – Parallel & Serial; Simplex, Half Duplex and Full Duplex.

Internet Communication.

o Internet Communication.
o Features and Developments.
o Internet Connectivity: Types.
o Data Security: Virus – Security Methods.

INFORMATION RETRIEVAL SYSTEMS

Information Storage and Retrieval (IR) Systems:
Components, IR tools. Information Analysis, repackaging and consolidation. Content Creation / Content Development.
Indexing: Principles / general theory of indexing. Content Analysis. Indexing Languages, Types, Characteristics.
Thesaurus. Pre and post-coordinate indexing.
Chain Indexing, PRECIS. Uniterm, Keyword and Citation Indexing.
Computer based indexing systems.
Standards for Bibliographic Description: ISBDs, MARC, CCF and MARC 21.
Metadata: Features of MARC, Dublin Core.
Data Mining, Data Warehousing.
Digital Object Identifier (DOI)
Information Retrieval: Methods – manual and automated. Search processes and

strategies. Boolean Logic. Preparation of query. Search tools – search engines, meta-
search engines. Subject directories, subject guides. Criteria for evaluation of IR

Systems.
Computerized Information Services: Machine Translation. Computerized Abstracting.
Natural Language Processing.

RESEARCH METHODOLOGY

Research: Basic Concepts -- Validity, Reliability, Objectivity, Subjectivity and Variables. Logic and Intuition.
Basic and applied research, Team Research, Relay Research.
Scientific method. LIS Research in India.
Research Design: Problem identification, formulation.
Hypothesis: Formulation, Types, Verification of Hypothesis.
Methods of Research: Survey, descriptive, comparative, historical, experimental, case study and Delphi technique.
Types of data – Primary and Secondary.
Data Collection Methods: Questionnaire, Interview and Observation. Secondary data – Historical / recorded. Sampling methods and techniques:
Probability sample, Simple Random sampling, Systematic, Stratified. Non-probability
sample: Quota, Accidental, Purposive, Incomplete. Cluster and Multi-State sampling.
Sample size.
Methods and Tools of Data Analysis:
Problem measure, reliability, validity, Descriptive Statistics – Measures of Central
Tendency : Mean, Median, Mode. Measure of Central distendency : Standard Deviation.
Graphical Presentation of data : Bar diagrams, Pie-chart, Line Graphics, Histograms,
Inferential Statistics, Measure of Association, Co-efficient of Correlation.Testing of Hypothesis : Chi-square test & T-test.
Writing research report: Contents of report, presentation of findings. Style Sheets, Citation of Print, Electronic and Internet Resources.

INFORMATION SYSTEMS AND PROGRAMMES

Information Organisation as a System:
Basic concepts, Components, Types, Characteristics of an Information System.
Kinds of Information Systems:
Libraries, Documentation Centres, Information Centres, Data Banks, Information Analysis Centres, Referral Centres, Clearing Houses, Archives, Reprographic and Translation Centres – their functions and services.
Planning and Design of a National Information System:
NAPLIS (National Policy on Library & Information Systems), NATIS, National Information Policy (NIP).
Planning Design of National Information System (NATIS).
National Information Systems:
NISCAIR, DESIDOC, NASSDOC, SENDOC, CORD, NCSI, NISSAT, ENVIS.
Regional Information Systems:
ASTINFO, APINESS and SAARC (SDC).
Global Information Systems:
UNESCO-PGI, INIS, AGRIS, INSPEC, MEDLARS.
Information Products and Services:
Types with examples.
Information Products Vs Services.
Information Services – Bibliographic, Document Delivery, Alert.

Information Providers (Vendors): DIALOG, STN, Derwent, UMI, BLDSC, ISI.

LIBRARY AUTOMATION AND NETWORKING

Computers: Functions, and how a computer works.
General computer terminology.
Communication : Analog & Digital Signals. Transmission Media.
Types of Computers. Generations of computers.
Data and Information. Data Representation and File Organization
Components of Computers:
Hardware – Input – Output devices. Storage devices, Ports.
Types of software, Program, Algorithm, Flow Charting.
Optical Storage Devices: CD and DVD.
Multimedia.
Data Processing – Batch, Online and Time Sharing.
Programming Languages : Machine, Assembly and Higher level.
Algorithm, Programme. Flow Charting
Operating Systems: DOS and Windows.
Application Software: MS-Word, MS-Access.
Networking: Concept and Types.
Internet – Browsing. Browsers. Services, Facilities. WWW, URL.
Computers in Library & Information Centres.
Library Automation: Areas of Automation.
Hardware and Software selection and Implementation.
Barcode Technology.: Types of barcodes : Dumb / Generic barcode and smart barcode
– their application. Code 39.
RFID (Radio Frequency Identification)

Networking: Concept, need and advantages. Basic components of network.
Network Topologies – Star, Ring, Bus, Hierarchical, Tree and Complete. Wireless Networking.
Types of Networks – LAN, MAN, WAN.
Networks: General – ERNET, NICNET, INFONET. Library Networks: OCLC, INFLIBNET.
Internet: Concept, Features, Services.
Search Engines and Meta Search Engines.
Internet: Internet Searching. Web Browsers. Internet Security.
Internet Reference Resources
Evaluation of Internet Information Sources.
Protocols: TCP / IP, OSI. Other Protocols: Telnet, FTP, HTTP, Z39.50.
Hypertext, Hypermedia. Markup Languages – HTML, XML.
Web Content Development / Content Creation for Web.
Web Design. Software – Flash, Macromedia, MS-Frontpage, Dreamweaver.

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28- CASUALTY MEDICAL OFFICER:

1. General Surgery Including Orthopaedics:

1. Wound healing
2. Fluid and electrolytes
3. Nutritional Support
4. Wound infection, special infections, AIDs
5. Sterilization, methods and precautions
6. Transplantation
7. Tumors
8. Skin diseases and Plastic surgery. Burns.
9. Arterial disorders and venous disorders, Lymphatics
10. Accident and emergency Surgery
11. Cleft lip and palate
12. Disorders of salivary gland
13. Sutures
14. Thyroid
15. Parathyroid and Adernal glands
16. Breast
17. Thorax – Injureis and diseases of Lung, Diaphregm
18. Heart
19. Liver
20. Spleen
21. Gall bladder and Bileducts
22. Pancreas
23. Peritoneum, Omentum, Mesentry and Retroperitoneal spaces.
24. Small and large intestine
25. Intestinal obstruction
26. Appendix
27. Rectum
28. Anus and Anal Canal
29. Hernias
30. Urology
31. Fractures
32. Tumors of Bone, Benign and Malignant
33. Metabolic and Non infection disorders of bones and joints.
34. Infection of Joints, Pyogoenic, Tuberculosis
35. Injuries of spine and pelvis & their management.

2. Medicine:

1. Cardinal manifestations and presentation of diseases.
2. Genetics.
3. Nutritional diseases
4. Hematology
5. Infectious diseases
6. Disease of Cardio Vascular system
7. Diseases of Respiratory system
8. Diseases of Kidney and Urinary tract

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9. Diseases of Gastro Intestinal system.
10. Diseases of Immune system, connective tissue and joints
11. Endocrinology & Metabolism.
12. Neurologic disorders.
13. Environment and occupational hazards.
3. Obstetrics And Gynaecology:
1. Introduction to Obstetrics
2. Development of human placenta and embryo, anomalies of placenta and coord.
3. Formation of liquor amni and its circulation.
4. Anatatomical and physiological changes during pregnancy.
5. Diagnosis of pregnancy
6. Methods of Obsterical and Pelvic examination and special investigations.
7. Role of USG and Radiology in Obstetrics.
8. Antenatal care including use of drugs during pregnancy.
9. Antepartum, foetal surveillance in high risk pregnancies.
10. Social Obstetrics
11. Anemia in pregnancy
12. Heart diseases in pregnancy.
13. Diabetes, prediabetic state, glycoosuria in pregnancy
14. Respiratory diseases in pregnancy.
15. Psychiatric disorders in pregnancy and purperium
16. Jaundice in pregnancy
17. Skin diseases in pregnancy
18. Urinary Tract infection in pregnancy including Asymptomaticbacteruria, chronic renal infection in pregnancy, renal failure in pregnancy.
19. Hypertensive disorders in pregnancy.
20. APH-plalcentaprevia accidental haemorrhage and extra placental causeshypofibrinogenemis,diagnosis and management, DUC annuria.
21. Rh factor Pathology Rh testing and management of pregnancy and new born.
22. Multiple pregnancy
23. Postmaturity
24. Intrauterine growth retardation
25. Intrauterine death.
26. Recurrent pregnancy - wastages
27. Surgical Gynecological conditions with pregnancy
28. Abnormal position and presentations
29. Special cases
30. Normal Labour
31. Preterm Labour
32. Abnormal Uterine action
33. Prolonged labour
34. Normal Pelvis and foetal skull
35. Contracted Pelvis, CPD, Pelvic assessment
36. Obstructed Labour
37. Injuries of Genital Tract
38. Injury of the Urinary System
39. Obstetrical Palsy
40. Postpartum Collapse.
41. Normal Pueperium
42. Puerperal infection
43. Neonatology
44. Obstetrical procedure.

45. Anatomy of Uro Genital tract
46. Development of Urogenitaltract.
47. Physiology of Menstruation, ovulation and Normal Contro.
48. Gynaecological History taking, examination and investigation.
49. Sex differentiation, asexuality & Intersexuality.
50. Amenorrhoea causes, Diagnosis and Management.
51. Infertility Male & Female causes, Diagnosis with investigation and management with newer modalities.
52. Dysmenorrhoea
53. Abnormal uterine bleeding
54. Abortions.
55. Trophoblastic tumors
56. Ectopic pregnancy
57. Infections of Genital tract.
58. Genital prolapse Retroversion
59. Urinary Incontinence
60. Rectal inconteinence
61. Endommetrioosis and Adenornysis.
62. Benign conditions and benign tumors.
63. Pruritis
64. Chronic Vulval Dystrophies
65. Tumors of Uterus
66. Ovarian Tumors
67. Genital Cancers
68. Menopause
69. Role of USG & Radiology in Gynae
70. Preoperative and postoperative management & complications of major Gynae surgery.
71. Gynaecological surgery
72. MTP 1st and 2nd Trimester
73. Contraceptions including Voluntary surgical contraception.
74. Demography

3. Pediatrics:

1. Basic sciences as applied to paediatrics
2. Growth and development.
3. Adolescence
4. Clinical biostatistics
5. Community paediatrics, including National Programmes.
6. Immunization
7. Nutritional requirements and nutritional disorders.
8. Infectious disease, including parasitic infestations
9. Infections- Respiratory, G.I, CNS, Genito-Urinary, Hematopoietic infections in neonates, infants,children and adolescents.
10. Systemic diseases.
11. Neonatology including antenatal paediatrics.

4. Preventive and Social Medicine:

1. History of Preventive and Social Medicine.
2. Concepts of Health and Diseases.

3. Nutrition and Health
4. Social Science and Health
5. Environment & Health
6. Occupational Health
7. Genetics and Health
8. Public Health Administration
9. Demography and Family Planning
10. Maternal and Child Health
11. Immunity and Immunization
12. Epidemiology of communicable and non-communicable diseases.
13. National Control/Eradication programmes relevant to specific diseases.
14. Health Information systems for the routine and vital health statistics
15. Primary Health care-Principles, components and levels of practice in the health care infrastructure.
16. Health Education
17. International Health.

5. Forensic Medicine & Texicology:

1. Medicolegal examination of injured person
2. Medicolegal examination of Rape victim
3. Medicolegal examination of Sodomy
4. Examination of accused of Rape
5. Medicolegal Examination of Intoxicated person
6. Procedure for conducting Medicolegal Post-mortem
7. Essential requirements for conduct of Medicolegal Post-mortem
8. Autopsy of Foctus
9. To calculate time since death on post-mortem
10. Examination of Skeletal remains
11. Technique of Viscera Preservation on post-mortem examination
12. Exhumation & Post-mortem
13. Medicolegal duties of Doctor in Poisoned Patients
14. Duties of a R.M.P
15. Procedure of recording Evidence
16. Recording of Firearm injuries
17. Forensic Science Laboratory
18. Post-mortem in case of Hanging and strangulation
19. Age Certification
20. Medical Jurisprudence
21. Forensic psychiatry
22. Thanatology
23. Deliriant poisons
24. Fire arm & bomb blast injury

7. Anatomy:

a. Cardiovascular system and lymphatic system-Blood supply of heart +lymphatic drainage of heart.
b. Thoracic outlet syndrome
c. Abdominal quadrants
d. Vermiform appendix-Positions of appendix
e. Difference between male and female pelvis
f. Layers of Scalp

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g. Triangles of neck, contents of anterior triangle
h. Paranasal sinuses with applied anatomy
i. Cartilages of larynx
j. Names of Cranial Nerves
k. Pharyngal arches
l. History of cardiac muscles
m. Difference between thick and thin Skin
n. Annual pancreas

8. Physiology:

Nerve Muscles
a. Neuromuscular transmission
b. Muscle proteins(Biochemistry)
c. Excitation-Contraction coupling
Blood
a. Anemia
b. Hemostatis
Respiratory System
a. Mechanics of respiration-I
b. Mechanics of respiration-II
Cardiovascular System
a. ECG
b. Exercise physiology
c. Cardiovascular reflexes
d. Special features of circulation in skeletal muscles and skin Gastrointestinal System
a. Introduction of G.I. Physiology: General organization of G.I. tract
b. Pathophysiology of diarrheal disease

Nutrition

a. Diet during pregnancy and lactation
b. Diet during infancy and childhood
Environmental Physiology
a. Man in cold environment
b. Man in hot environment
Reproduction
a. Introduction to reproductive system
Kidney
a. Renal Tubular function-I
b. Renal tubular function-II
c. Micturition
General
a. CSF
b. Physiology of pain
c. Brain stem reflexs, stretch reflexes and tendon reflexes
d. Basal ganglia
e. Speech
f. Functional anatomy of eye
g. Functional anatomy of ear: impedance matching
h. Auditory pathway

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i. Olfaction
j. Physiology of taste

9.Biochemistry:
a. Molecular Biology-its role in Clinical Biochemistry

Structure, biochemical role of DNA and RNA, Genomes, Basic concepts of DNA & RNA
metabolism Replication, Transcription and Translation-importance of their inhibitors,
Recombinant DNA technology and polymerase chain reaction-their role in medicine, Gene
therapy, Genomics and Bioinformatics, their relevance to medicine.
b. Biochemical basis of Hormone action
Communication among cells and tissues, Molecular mechanism of action of Steroid hormones,
hormones of pancreas, thyroid and parathyroid, Signal transduction, G-Proteins coupled
receptors and second messengers, Role of leptins and adipocytokines.
c. Clinical Biochemistry
Organ function tests: Liver function tests, Kidney function tests, Thyroid function tests, Adrenal
and Pancreatic function tests, Tumor markers and growth factors, Biochemical changes in
pregnancy and lactation, Water and electrolytes balance and imbalance, Acid-base balance and
disorders. Total Quality Management of Laboratories, Internal quality control, External quality
control, Accreditation of laboratories.

10. Microbiology:
a. General Bacteriology
i. Sterilization/disinfection
ii. Culture media
iii. Antimicrobial sensitivity
iv. Bacterial genetics
b. System Bacteriology
i. Gram positive bacteria
ii. Gram Negative bacteria
iii. Mycobacteria
c. Immunology
i. Innate and Adaptive immune responses
ii. Hypersensitivity
iii. Autoimmunity
d. Virology
i. DNA/RNA viruses
ii. HIV
iii. Herpes viruses

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11. Pharmacology:

i. General Pharmacology
ii. Autonomic nervous system
iii. Cardiovascular system
iv. Central Nervous
v. Antibiotics and chemotherapy

12. ENT:
1. Complications of Otitis media
2. Otosclerosis and tympanoplasty
3. BERA
4. Acoustic neuroma (tumors of ear)
5. FESS/ESS
6. Neurological affections of larynx
7. Hoarseness and tumors
8. Tracheostomy
9. Diseases and tumors of thyroid
10. ENT manifestation of AIDS

13. Ophthalmology:
1 Lids:

I. Entropeon
II. Ectropeon
III. Ptosis
2.Cornea

I. Corneal ulcer
II. Keretoconus
III. Lasik laser

3. Lens

I. Senile cataract
II. Subluxlated lens
III. Multifocal iol

4. Retina

I. Diabetic Retinopathy
II. Macular hole
III. Retinal detachment

5. Optic nerve
I. Optic atrophy
II. Pappiliedema
III. Dilated pupil

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14. Radiology:

I. Radiation Protection and hazards
II. Basics of x-ray, ultrasound, CT and MRI
III. Basics of PET & SPECT
IV. Clinical indications/contraindications of CT, MRI and PET
V. Contrast media and their adverse reactions and their management
VI. Radiological investigations like IVP, HSG, Barium studies
VII. Ultrasonography and Doppler.

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