Sl. No		Disease	Blood Investigation and their expected values
A.	**Benign and Malignant Tumors**		
	1.	Primary Lymphoma	i. Elevated lactate dehydrogenase (LDH) level; directly proportional to disease load. ii. Elevated ESR iii. Hypercalcemia in some patients (Signifies poor prognosis)
	2.	Multiple Myeloma	i. Monoclonal Hypergamaglobulinemia ii. Reversal of serum albumin:globulin ratio iii. Increased serum total protein to 8–16 %. iv. Anemia v. Hypercalcemia vi. Elevated ESR vii. Increased alkaline phosphatase level.
	3.	Solitary Plasma Cell Myeloma(Plasmacytoma)	i. Bence Jones proteins in serum of few patients (24-72%). ii. Monoclonal proteins in serum of few patients with progressed disease. iii. Hyperglobulinemia & anemia (characteristic of multiple myeloma) is absent.
B.	**Salivary Glands Diseases**		
	1.	Sjögren Syndrome (SS) [28-30]	i. Elevated ESR ii. Elevated serum IgG (Polyclonal hyperglobulinemia) iii. Non specific serum antibodies iv. Positive Rheumatoid factor (75% of Cases) v. ANA in Primary SS vi. Salivary gland autoantibodies (mainly anti slivary duct antibody) in Secondary SS
C.	**Bacterial Infections**		
	1.	In all bacterial Infections (General finding)	i. Leukocytosis ii. Increased ESR
	2.	Syphillis [31-37]	i. Non specific and highly sensitive:VDRL ii. Specific and Sensitive: a. FTA – ABS b. TPHA
	3.	Cat Scratch disease	Serologic tests: Highly specific and sensitive i. Indirect fluorescent antibody assay to antibody titer ii. ELISA for IgM antibody iii. PCR (These are 100 % accurate)
	4.	Rheumatoid arthritis [22]	i. Increased Rh factor ii. Increased ESR iii. Anemia
D.	**Viral Infections[38]:**		
	1.	Herpes Simplex Virus (HSV) Infection	i. Serology for HSV antibody from initial and convalescent sera. *Increased antibody titer in convalescent sera.*
	2.	Herpes Zoster Virus Infection	i. Serology for HSV antibody from initial and convalescent sera. *Increased antibody titer in convalescent sera.*
	3.	Epstein Barr Virus Infection	i. Increased WBC count ii. Increased lymphocyte count (70-90 % by 2nd week) iii. Atypical lymphocytes in peripheral smear iv. Paul Bunnel Heterophil antibody in serology v. Indirect immunofluorescence for EBV antibody in

Sl. No	Disease		Blood Investigation and their expected values
			patients with negative Paul Bunnel test. vi. ELISA and Recombinant DNA tests demonstrate antigens.
	4.	Cytomegalo Virus Infection	i. Increased Viral antibody titer
	5.	Enterovirus / Coxsackae virus Infection	i. Increased antibody titer in acute and convalescent sera.
	6.	Rubella & Rubeola	i. Detection of viral antigen in serum ii. Increased serum antibody titer
	8.	Mumps	i. Four times rise in mumps specific IgM ii. Mumps specific IgG can be detected two weeks later. {Done for acadmic intrest}
	9.	Chikunguya	i. Neutralizing & hemagglutination inhibiting (HI) antibodies in serum. ii. RT-PCR is confirmatory. iii. IgM capture ELISA is most sensitive assay (helps in differentiating from dengue).
	10.	Human Immunodeficiency Virus (HIV) Infection	Non Specific Tests: i. Lymphocytopenia ii. CD4 Cell Count: Reduced to < 200 cells/mm3 iii. Inversion of T4:T8 ratio iv. Increase in IgG and IgA levels. Specific Tests: i. HIV Enzyme Immunoassay (ELISA). ii. HIV Western Blot. iii. Indirect immunofluoresence assay. iv. Radio-immuno precipitation assay. v. Rapid Latex Agglutination assay. vi. DOT- immuno-binding assays and others. vii. Passive heamagglutination assay viii. HIV Tridot Assay ix. P24 Antigen capture assay. x. Direct HIV Detection a. Viral culture. b. Detection of viral nucleic acid: i) DNA PCR. ii) Reverse Transcriptase PCR. iii) Quantitative Competitive PCR
E.	**Mycotic Infections:**		
	1.	Cryptococcal infection	i. Antigen in serum and CSF
	2.	Toxoplasmosis	i. Rise in serum antibody titer of *T. gondium* within 10 -14 days of infection. {Not helpful in immunocompromised patients}
F.	**Periodontal Diseases**		
	1.	Acute Necrotising Ulcerative Gingivitis	i. Leukocytosis ii. Increased ESR
	2.	Periodontal abscess	i. Leukocytosis
	3	Pericoronitis	i. Leukocytosis
	4	Chronic periodontitis	i. Plaque antigen induced peripheral blood lymphocyte blastogenesis.
G.	**Pulp and Periapical Diseases**		
	1.	Infected cyst	i. Leukocytosis

Sl. No		Disease	Blood Investigation and their expected values
			ii. Increased ESR
	2.	Periapical Abscess	i. Leukocytosis
	3.	Osteomyelitis	i. Leukocytosis ii. Increased ESR
	4.	Cellulitis, Facial space infection & Ludwig's Angina	i. Leukocytosis ii. Increased ESR
H.	**Oral aspects of metabolic diseases**		
	1.	Hurler Syndrome	i. Metachromatic granules (Reilly Bodies) in cytoplasm of circulating lymphocytes.
	2.	Letterer Siwe disease	i. Progressive anemia ii. Leukopenia iii. Thrombocytopenia
	3.	Jaundice	i. Increased serum bilirubin level
	4.	Riboflavin deficiency	i. Normocytic normochromic anemia
	5.	Pituitary dwarfism	i. Decreased Growth hormone
	6.	Hypothyroidism	i. Decreased T4 level ii. Increased TSH level
	7.	Hyperthyroidism	i. Increased T4 level ii. Decreased TSH level
	8.	Hypoparathyroidism	i. Decreased Parathormone (PTH) ii. Decreased Serum Calcium iii. Increased Serum Phosphate
	9.	Pseudohypoparathyroidism	i. Elevated serum PTH ii. Decreased serum Calcium iii. Elevated serum phosphate
	10.	Hyperparathyroidism	i. Increased PTH ii. Decreased serum calcium
	11.	Addison's disease	i. Elevated plasma ACTH
	12.	Diabetes Mellitus	i. Elevated blood glucose {FBS, PPBS, RBS, GTT} ii. Glycated or glycosylated hemoglobin assay (glycohemoglobin test): Hemoglobin A1 (HbA1) test and the Hemoglobin A1c (HbA1c) test.
	13.	Hypophosphatemia	i. Decreased serum alkaline phosphatase ii. Elevated serum phosphate
I.	**Allergic and Immunological Reactions:**		
	1.	Bechet's Syndrome	i. Hypergamaaglobulinemia ii. Leukocytosis iii. Eosinophilia iv. Elevated ESR
	2.	Reiter's Syndrome	i. Mild leukocytosis ii. Increased ESR
	3.	Sarcoidosis	i. Eosinophilia, ii. Leucopoenia, iii. Anaemia, iv. Thrombocytopenia v. Elevated serum alkaline phosphatase level Increased ESR vi. Increased serum calcium and Urine Calcium
	4.	Wegner's Granulomatosis	i. Anemia ii. Leukocytosis iii. Increased ESR iv. Hyperglobilinemia v. Antibody detection against cytoplasmic component of neutrophil

Sl. No	Disease		Blood Investigation and their expected values
			vi. Anti-neutrophil Cytoplasmic antibodies (ANCA)
J.	**Bone Pathology**		
	1.	Osteopetrosis	i. Myelophitistic anaemia ii. Hypocalcemia in severe cases iii. Increased PTH level iv. Alkaline phosphatase level not increased. v. Increased acid phosphatase level.
	2.	Fibrous Dysplasia	i. Elevated alkaline phosphatase.
	3.	McCune Albright's Syndrome	i. No consistent change in serum calcium or phosphate ii. Serum alkaline phosphatase may be elevated.
	3.	Cherubism	i. Negative findings for hyperparathyroidism help in differential diagnosis (Normal PTH, serum calcium & phosphate level).
	4.	Vitamin D Resistant Rickets	i. Normal serum calcium or hypocalcemia. ii. Increased acid phosphatase. iii. Hypophophatinemia iv. Increased PTH level v. Low calcitriol
	4.	Massive Osteolysis	i. Normal value for all laboratory studies (Helpful in differentialdiagnosis)
	5.	Paget's disease	i. Elevated serum alkaline phosphatase level up to 250 Bodansky unit. ii. Normal blood calcium and phosphate level
	6.	Familial Gigantiform Cementoma	i. Elevated serum alkaline phosphatase level {not in all cases} ii. Anaemia
	7.	Hand Schüller Christian Disease	i. Anemia ii. Thrombocytopenia Occasionally iii. Leukopenia iv. Normal serum cholesterol level (Tissue cholesterol is elevated)
K.	**Hematological Disorders:**		
	(A) Disorders involving Red blood Cells: **(1) Anemias:**		
	1.	Pernicious Anemia	i. Normochromic and Macrocytic anemia ii. Decreased RBC Count often less than 10,00,000/cu mm of blood. iii. Poikilocytosis of RBC iv. Variation in shape of RBC v. Increased Hb content of RBC in proportion to their increased size vi. Normal MCHC vii. Decreased serum cobolamine level viii. Advanced Cases: Polychromatophillic cells, Stippled cells, Howel Jolly es, Cabot's Rings, ix. Leukocytes too remarkably reduced in number. x. Increase in average size of WBC. xi. Increase in number of lobes of nucleus of WBC (macropolycytes)
	2.	Sprue (Idiopathic Steatorrhea; Celiac Disease)	i. Identical to pernicious anemia.
	3.	Aplastic Anemia	i. Decreased RBC Count often less than 10,00,000/cu mm of blood.

Sl. No	Disease		Blood Investigation and their expected values
			ii. Tear drop poikilocytes iii. Decreased hematocrit and Hb % iv. Decreased Leukocyte count (Granular series) v. Thrombocytopenia vi. Increased bleeding time vii. Normal clotting time viii. Poor clot retraction ix. Positive tourniquet test
	4.	Thalassameia	i. Hypochromic microcytic anemia ii. Poikilocytosis and anisocytosis of RBC iii. Extremly pale RBC, may appear like target cells. iv. Safety pin cells v. Normoblastic RBC vi. Elevated WBC count (25,000 or more / cu mm of blood)
	5.	Sickle cell anemia	i. Decreased RBC count (10,00,000 cells /cu mm or less) ii. High reticulocyte count iii. Decreased Hb % iv. Sickle shaped RBC in peripheral smear v. Elevated lactase dehydrogenase (LDH) vi. Decreased heptoglobin (confirms hemolysis)
	6.	Erythroblastosis fetalis	i. Reduced to normal RBC count (may reach upto 10,00,000 cells /cu mm or less) ii. Large number of normoblasts
	7.	Iron Deficiency Anemia	i. Hypochromic microcytic anemia of variable degree ii. RBC count generally between 30,00,000 to 40,00,000 cells / cu mm of blood iii. Decreased Hb % iv. Low serum iron
		(2) Polycythemia	
	1.	Polycythemia Vera	i. Elevated RBC count (may exceed 10,000,000 cells /cu mm of blood) ii. Elevated Hb % (upto 20 gm %) iii. Colour Index of Hb is less than 1 iv. Normal or slightly decreased plasma volume. v. Increased vescocity and specific gravity of blood vi. Leukocytosis vii. Increased platelet count viii. Increased total blood volume ix. Normal BT and CT
	(B) Disorders involving White Blood Cells **(1) Leukopenia**		
	1.	Agranulocytosis	i. WBC count often below 2,000 cells / cu mm of blood ii. Almost complete absence of granulocytes or PMNs iii. Normal platelet count iv. Occasional anemia
	2.	Cyclic Neutropenia	i. Blood changes seen in periodic fashion correlating with clinical appearances of symptoms ii. Cycle commonly occurs every three weeks

Sl. No	Disease		Blood Investigation and their expected values
			iii. Normal blood count which over 4 to 5 days exhibits decease in neutrophil and increase in monocyte and lymphocyte count iv. At the height of disease the neutrophil may completely disappear
	3.	Chédiak Higashi Syndrome	i. Giant abnormal granules in the peripheral circulating leukocytes.
	(2) Leukocytosis		
	1.	Infectitious Mononucleosis	i. Atypical Lymphocytes in circulating blood ii. Antibodies to EB virus iii. Increased heterophil antibody titer. iv. Posistive Paul Bunnell test (Pathognomic and Characteristic) v. Increase in WBC count (Lymphocytosis) vi. More than 50 % lymphocytes out of which about 10 % are atypical (Oval / horse shoe shaped) vii. Thrombocytopenia viii. Normal ESR in acute phase.
	2.	Acute Leukemia	i. Anemia and Thrombocytopenia ii. Bleeding time and clotting time increased in some instances iii. Tourniquet test is positive iv. Leukocytic count increased in early stage but in terminal stage its 1,00,000 or more cells per cubic milimeter hence increase in differential count v. In Myeloid Lukemia – predominant cell is often resemble myloblasts or undifferentiated mylocytes. vi. In Lymphoid Lukemia – considerable variation in degree of differentiation vii. In Monocytic Lukemia – poorly differentiated cells are seen. viii. Highly undifferentiated cells are found in Stem cell leukemia.
	3.	Chronic Leukemia	i. Anemia and Thrombocytopenia ii. Leukocytosis may be great – iii. WBC count may be greater than 500,000 cells per cubic mm. iv. Sometimes very low count may also occur. Increased differential count v. 95% of total cells are leukemic.
	(C) Disorders involving the blood platelet **(1) Purpura**		
	1.	Thrombocytopenic	i. Platelet count below 60,000 platelets per cubic mm. ii. Prolonged bleeding time often 1 hour or more iii. Clotting time is normal but clot does not show retraction iv. Capillary fragility increased v. Strongly positive tourniquet test vi. RBC and WBC count is normal
	2.	Thrombotic Thrombocytopenic	i. Thrombocytopenia ii. Anemia

Sl. No	Disease		Blood Investigation and their expected values
			iii. Fragmented RBCs in peripheral smear iv. Elevated Reticulocyte count v. PT & activated PTT within normal limits vi. Increased LDH
	3.	Aldrich syndrome	i. Qualitative and quantitative defect in platelet ii. Platelet count vary from 18,000 – 80,000 per cubic mm. iii. Prolonged bleeding time iv. Considerable anisocytosis v. Microscopically – alteration in cell membrane vi. Biochemically- deficiency in ADP storage pool vii. Normal Megakaryocytes may be seen in bone marrow viii. Accelerated platelet clearance from peripheral blood
	(2) Thrombasthenia		
	1.	Familial thrombasthenia	i. Prolonged bleeding time ii. Impaired clot retraction iii. Normal platelet count
	2.	Thrombocytopathic purpura	i. Nearly normal platelet count ii. Normal or prolonged bleeding time iii. Defective platelet aggregation
	3.	Thrombocythemia	i. Highly increased platelet count ii. Abnormal platelet aggregation iii. Normal clotting time, clot retraction time and tourniquet test. iv. Prolonged bleeding time. v. Normal RBC and WBC count (may be altered in secondary thrombocythemia, depending on associated condition)
	(D) Disorders involving specific blood factors		
	1.	Hemophilia	i. Prolonged clotting time ii. Normal bleeding time, prothrombin time and platelet aggregation. iii. Impaired clot retraction in vitro
	2.	Von Willebrand's Disease	i. Prolonged bleeding time (from several minutes to few hours) ii. Wide variation in bleeding time in same patient at different times. iii. Normal clotting time (may be slightly prolonged) iv. Increased capillary fragility (Positive tourniquet test) v. Poor platelet adherence
	3.	Parahemophilia	i. Normal platelet count ii. Increased clotting time iii. Increased prothrombin time iv. Normal bleeding time
	4.	Afibrinogenemia	i. Normal RBC, WBC and Platelet count ii. Occasional thrombocytopenia iii. Normal or slightly prolonged bleeding time

Sl. No	Disease		Blood Investigation and their expected values
			iv. Infinite clotting time and prothrombin time v. Peripheral blood fails to clot even after addition of thrombin vi. Tourniquet test is normal vii. ESR is zero with cells remaining suspended even after 24 hours
	5.	Dysfibrogenemia	i. Prolonged PT & aPTT
	6.	Fibrin stabilizing factor deficiency	i. Factor XIII α & β deficiency (Quantified by ELISA) ii. Clot dissolves within minutes to hours
	7.	Macroglobulinemia	i. Severe anemia ii. Hb level near 4-6% iii. Extremely elevated ESR iv. Frequent gelling of serum upon cooling to room temperature v. Extremely high viscosity of serum vi. TLC, Platelet count, BT, CT & PT within normal limits vii. Lymphocytosis, neutropenia and thrombocytopenia seen occasionally.
L.	**Epithelial (Skin) Disease**		
	1.	Dyskeratosis congenital	i. Aplastic anaemia ii. Thrombocytopenia, iii. Leukopenia iv. Pancytopenia
	2.	Dermatitis herpetiformis	i. Occasionally eosinophilia of over10%
	3.	Acrodermatitis enteropathica	i. Low plasma zinc level ii. Reduced serum alkaline phosphatase in later stages.
	4.	Systemic and Discoid Lupus Erythematosis {SLE/DLE}	i. 'LE' cells are present (Rarely in DLE) ii. Increased ESR iii. Anaemia, iv. Leukopenia, v. Lymphopenia, vi. Thrombocytopenia vii. Anti Nuclear Antibodies (More common in SLE) viii. Elevated serum gamma globulin ix. Positive Coombs test
	5.	Lupus like lesions	i. Elevated serum ANA ii. Antibody against double stranded DNA in serum {Helps in differentiation from LE}
	6.	Systemic Sclerosis	i. Anti-centromere antibodies ii. Anti SCL 70 antibody (Topoisomerase 1)
	7.	CREST syndrome	i. Anti-centromere antibodies
	8.	Pemphigus vulgaris	i. Positive for indirect immunofluorescence
	9.	Bullous Pemphigoid	i. Positive for indirect immunofluorescence
M.	**Neuromuscular Disorders**		
	1.	Myasthenia Gravis	i. Elevated serum Acetylcholine receptor antibody
	2.	Burning Mouth Syndrome	i. Anemia
	3.	Severe Generalized Familial Muscular Dystrophy	i. Elevated serum Creatinin phosphokinase (in all affected males & 70% of female carriers; seen prior to clinical manifestation)