



PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

SCHEME FOR SECOND SEMESTER (Medical Lab Technology)

Sr. No.	Subject	Study Scheme			EVALUATION SCHEME						Total Marks
					INTERNAL ASSESSMENT		EXTERNAL ASSESSMENT (EXAMINATION)				
		Hrs/Week			Theory	Practical	Written Paper		Practical		
		L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.	
2.1	*Communication Skills-II	3	-	2	25	25	100	3	50	3	200
2.2	Organic Chemistry	3	-	2	25	25	100	3	50	3	200
2.3	Anatomy and Physiology-II	3	-	2	25	25	100	3	50	3	200
2.4	Clinical Microbiology-II	3	-	4	25	25	100	3	50	3	200
2.5	Haematology-II	3	-	4	25	25	100	3	50	3	200
2.6	Clinical Biochemistry-II	3	-	4	25	25	100	3	50	3	200
	# Student Centred Activities	-	-	4	-	25	-	-	-	-	25
Total		18	-	22	150	175	600	-	300	-	1225

* Common with other diploma programmes

Student Centered Activities will comprise of co-curricular activities like extension lectures, library studies, games, Hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C.,NSS, Cultural Activities, Civil Defence/Disaster Management activities etc.



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SYLLABUS: Polytechnic (DMLT)

Department:--Medical Lab Technology 2nd Semester

Subject: Communication Skills-II (Theory)

Subject Code: 120021

DETAILED CONTENTS

Unit No.1 Grammar and usage

- Topic No.1: Preposition
- Topic No.2: Determiners
- Topic No.3: Pronouns
- Topic No.4: Conjunction
- Topic No.5: Simple present tense
- Topic No.6: Simple past tense
- Topic No.7: Question tags

Unit No.2 Writing skill

- Topic No.8: Writing notice
- Topic No.9: Writing circular
- Topic No.10: Writing memo
- Topic No.11: Writing agenda for meeting
- Topic No.12: Writing minutes of the meeting
- Topic No.13: Telephonic message

Unit no. 3 Reading Skills

- Topic No. 14: Unseen Comprehension passages

STUDY SCHEME		EVALUATION SCHEME							Total Marks
		Internal Assessment			External Assessment (Examination)				
Hrs/week		Theory	Practical	Written Paper		Practical		Hrs	
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks		Hrs
3	-	-	25	-	100	3	-	-	125

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.
2. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.
3. Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS:

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	15	30
2.	15	35
3.	18	35
Total	48	100



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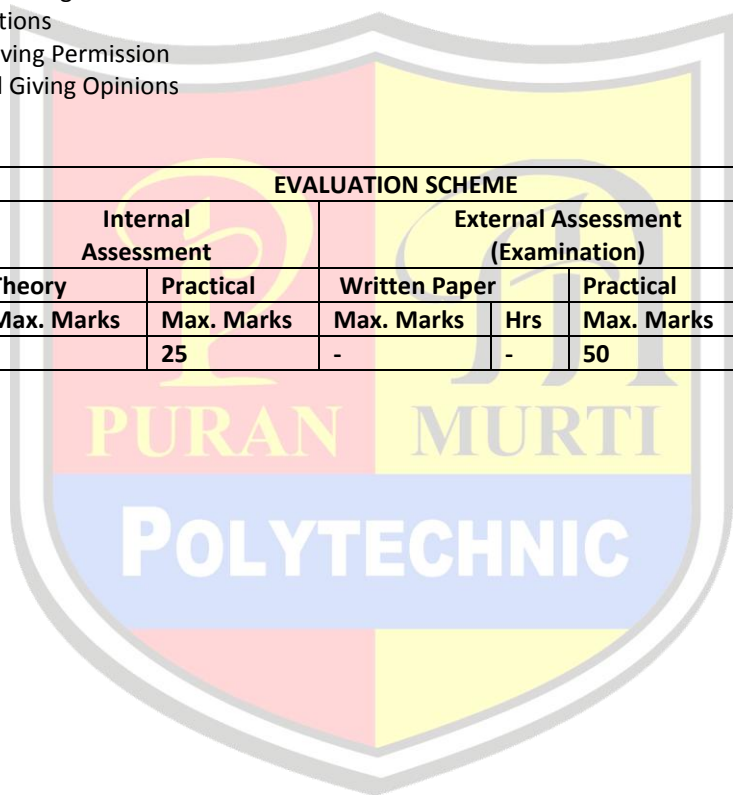
Subject: Communication Skills -II (Practical)

Subject Code: 120011(P)

LIST OF PRACTICALS

1. Offering-Responding to Offers
2. Requesting-Responding to Requests
3. Congratulating
4. Expressing Sympathy and Condolences
5. Expressing Disappointments
6. Asking Questions-Polite Responses
7. Apologizing, Forgiving
8. Complaining
9. Persuading
10. Warning
11. Asking for and Giving Information
12. Giving Instructions
13. Getting and Giving Permission
14. Asking For and Giving Opinions

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75





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Subject: Organic Chemistry (Theory)

Subject Code: 121926

DETAILED CONTENTS

Unit No.1 Organic chemistry

- Topic No.1: Introduction and importance of organic compounds
- Topic No.2: Comparison of organic and inorganic compounds
- Topic No.3: Properties of carbon and Hydrogen

Unit No.2 IUPAC Nomenclature of organic compounds

- Topic No.4: Hydrocarbons
- Topic No.5: Alcohols and Ethers
- Topic No.6: Aldehydes and Ketones
- Topic No.7: Carboxylic Acids

Unit No.3 Hydrocarbons

- Topic No.8: Preparation, properties and uses of saturated hydrocarbons
- Topic No.9: Preparation, properties and uses of unsaturated hydrocarbons
- Topic no.10: Sources of hydrocarbons
- Topic No.11: Preparation, properties and uses of Halogen derivatives of hydrocarbons

Unit No.4 Alcohols and ethers

- Topic No.12: General introduction, classification, preparation and properties and uses.
- Topic No.13: Methyl alcohol, Ethyl alcohol and glycerol
- Topic No.14: Diethyl ether

Unit No.5 Aldehydes and ketones

- Topic No.15: General introduction, classification, properties and uses of: Methanal and ethanal
- Topic No.16: Structure of amines groups (primary, secondary and tertiary), important methods, preparation and Properties.

Unit No.6 Carboxylic Acids

- Topic No.17: General Introduction, classification, preparation, properties and uses of Methanoic acid and Ethanoic acid

Unit No.7 Carbohydrates

- Topic No.18: Definition
- Topic No.19: Composition, sources its importance
- Topic No.20: Classification
- Topic No.21: Estimation
- Topic No.22: Important monosaccharides, disaccharides, polysaccharides

Unit No.8 Lipids

- Topic No.23: Definition
- Topic No.24: Classification
- Topic No.25: Introduction to fatty acids, phospholipids, triglycerides,Cholesterol
- Topic No.26: Clinical importance of lipids

Unit No.9 Proteins

- Topic No.27: Definition
- Topic No.28: Classification
- Topic No.29: Compositon, molecular weight and hydrolysis
- Topic No.30: Name of various amino acids
- Topic No.31: Structure and properties of proteins
- Topic No.32: Clinical importance of proteins

Unit No.10 Enzymes

- Topic No.33: Definition
- Topic No.34: Classification
- Topic No.35: Chemical nature of enzymes
- Topic No.36: Properties of Enzyme



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Topic No.37: Factors affecting enzyme activity

Topic No.38: Clinical Importance of Enzymes

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	125
3	-	-	25	-	100	3	-	-	

TEXT BOOKS:

1. A textbook of Biochemistry and Clinical Pathology by Sukhdev Singh and Om Parkash

REFERENCE BOOKS:

1. Modern's Abc of Chemistry Vol I and II by Dr. S.P.Jauhar, Modern Publishers, New Delhi

SUGGESTED DISTRIBUTION OF MARKS:

Unit No.	Time allotted (Hrs)	Marks Allotted (%)
1	02	05
2	04	08
3	06	12
4	05	10
5	05	10
6	05	10
7	06	10
8	05	10
9	05	10
10	05	15
Total	48	100



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Subject: Organic Chemistry (Practical)

Subject Code: 121926(P)

LIST OF PRACTICALS

1. Iodometric titrations
2. Oxidation reduction titrations
3. Acid-base titrations
4. Estimation of carbohydrates by benedict's methods
5. Estimation of proteins by acitic acid & Salphosalicylic acid test
6. Estimation of lipids by direct method

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75





DETAILED CONTENTS

Unit No.1 Nervous system

- Topic No.1: Central nervous system (brain and spinal cord)
- Topic No.2: Peripheral nervous system (cranial and spinal nerves)
- Topic No.3: The sense organs (eye, ear, tongue and nose); structure and functions

Unit No.2 Muscular system

- Topic No.4: Brief description of skeletal, smooth and cardiac muscles
- Topic No.5: Muscle fatigue

Unit No.3 Circulatory system

- Topic No.6: Composition and functions of blood
- Topic No.7: Anatomy and physiology of Heart
- Topic No.8: Circulation of blood
- Topic No.9: Cardiac Cycle
- Topic No.10: Conducting System of Heart
- Topic No.11: The blood pressure
- Topic No.12: Arteries and veins- differences
- Topic No.13: Lymph and lymphatic system

Unit No.4 Endocrine system

- Topic No.14: Description of each endocrine gland its secretions and their effect on the body

Unit No.5 Reproductive System

- Topic No.15: Male and female reproductive system
- Topic No.16: The ovarian cycle and ovulation
- Topic No.17: Fertilization

STUDY SCHEME		EVALUATION SCHEME							Total Marks
		Internal Assessment			External Assessment (Examination)				
Hrs/week		Theory	Practical	Written Paper		Practical			
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks		Hrs
3	-	-	25	-	100	3	-	-	125

TEXT BOOKS:

1. Basic Anatomy and Physiology by N Muruges; Sathya Publishers, Madurai

REFERENCE BOOKS:

1. Anatomy and Physiology by Pears; JP Brothers, New Delhi
2. Anatomy and Physiology by Sears; ELBS, London

SUGGESTED DISTRIBUTION OF MARKS:

Topic No.	Time allotted (Hrs)	Marks Allotted (%)
1	08	16
2	06	12
3	14	30
4	10	20
5	10	22
Total	48	100



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Subject: Anatomy and Physiology (Practical)

Subject Code: 121922(P)

LIST OF EXPERIMENTS

1. Study of various parts of nervous system (brain and spinal cord).
2. Study of structure of eye and ear (demonstration from models)
3. Study of structural differences between skeletal, smooth and cardiac muscles through demonstration.
4. Study of various parts of circulatory system through demonstration.
5. Examination of stained blood film for blood cells
6. Estimation of blood pressure
7. Study of various parts of reproductive system (male and female demonstration from models and charts)

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75





DETAILED CONTENTS

Unit No.1 Bacteriology

- Topic No.1: Staphylococi
- Topic No.2: Streptococci and pneumococci
- Topic No.3: Enterobacteriaceae - (E coli, Salmonella, Shigella)
- Topic No.4: Pseudomonas
- Topic No.5: Proteus
- Topic No.6: Vibrio Cholerae
- Topic No.7: Neisseria
- Topic No.8: Treponema Pallidum
- Topic No.9: Mycobacterium tuberculosis

Unit No.2 Bacterial pathogenicity

- Topic No.10: Introduction of pathogenicity & infection.
- Topic No.11: Sources of infection
- Topic No.12: Mode of spread of infection
- Topic No.13: Types of infection

Unit No.3 Nosocomial Infection

- Topic No.14: Introduction
- Topic No.15: Common types and source of nosocomial infection
- Topic No.16: Control of nosocomial infections

Unit No.4 Laboratory diagnosis of infectious diseases

- Topic No.17: Respiratory tract infections (Throat Swab and Sputum sample)
- Topic No.18: Wound infections
- Topic No.19: Urinary tract infections
- Topic No.20: Enteric fever
- Topic No.21: Intestinal infection

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment			External Assessment (Examination)			
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks		Hrs
3	-	-	25	-	100	3	-		-

TEXT BOOKS:

1. Basic Anatomy and Physiology by N Muruges; Sathya Publishers, Madurai

REFERENCE BOOKS:

1. Anatomy and Physiology by Pears; JP Brothers, New Delhi
2. Anatomy and Physiology by Sears; ELBS, London

SUGGESTED DISTRIBUTION OF MARKS:

Topic No.	Time allotted	Marks Allotted (%)
1	26	50
2	06	15
3	06	15
4	10	20
Total	48	100



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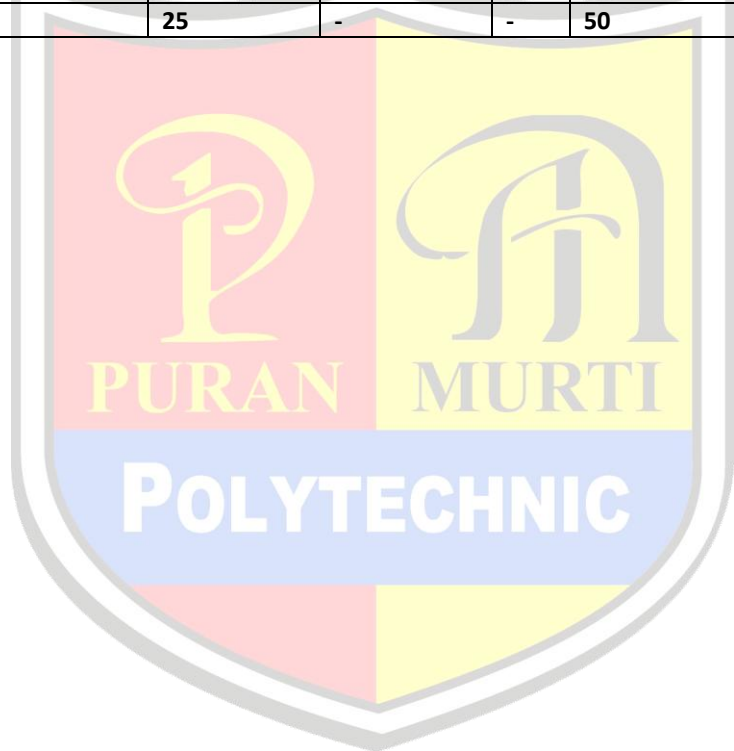
Subject: Clinical Microbiology (Practical)

Subject Code: 121923(P)

LIST OF PRACTICALS

1. Collection, transportation of clinical samples, processing including culture of following clinical samples for Identification of pathogens – Urine, Stool, Sputum, Throat swabs, Pus and Pus swabs, Blood, Skin, Eye and Ear Swabs and CSF.
2. Identification of known bacterial cultures of common pathogens.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75





DETAILED CONTENTS

Unit No.1 Haemoglobinometry

- Topic No.1: Formation of haemoglobin
- Topic No.2: function of haemoglobin
- Topic No.3: degradation of haemoglobin
- Topic No.4: Types of haemoglobin
- Topic No.5: Various methods of estimation with Specific reference to cyanmethaemoglobin method

Unit No.2 Haemocytometry

- Topic No.6: Various counting chambers
- Topic No.7: Methods of counting of RBC, their calculation and reference values.
- Topic No.8: Methods of counting of WBC, their calculation and reference values.
- Topic No.9: Methods of counting of platelets, their calculation and reference values.
- Topic No.10: Errors involved in haemocytometry and means to minimize them.

Unit No.3 Differential leucocyte counting (DLC)

- Topic No.11: Preparation and staining of blood film
- Topic No.12: Performance of DLC
- Topic No.13: Normal values and significance of DLC
- Topic No.14: Blood cell morphology in health and disease (Peripheral blood film)

Unit No.4 Quality Assurance in haematology

- Topic No.15: Quality Assurance in haematology such as accuracy, precision etc.

Unit No.5 Automation in haematology

- Topic No.16: Various types of Blood cell counter
- Topic No.17: Principle and operation of the automated blood cell counters

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment			External Assessment (Examination)			
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	125

TEXT BOOKS:

1. Medical Laboratory Technology Vol. 1 by KL Mukherjee; Tata McGraw Hill Publishers, New Delhi

REFERENCE BOOKS:

1. Textbook of Medical Laboratory Technology by Praful B Godkar; Bhalani Publishing House, Mumbai.
2. Medical Laboratory Science Theory and Practical by J Ochei and A Kolhatkar, Tata McGraw Hill Publishing Company Ltd., New Delhi 2000 Ed.

SUGGESTED DISTRIBUTION OF MARKS:

Topic No.	Time allotted (Hrs)	Marks Allotted (%)
1	12	24
2	18	40
3	06	12
4	06	12
5	06	12
Total	48	100



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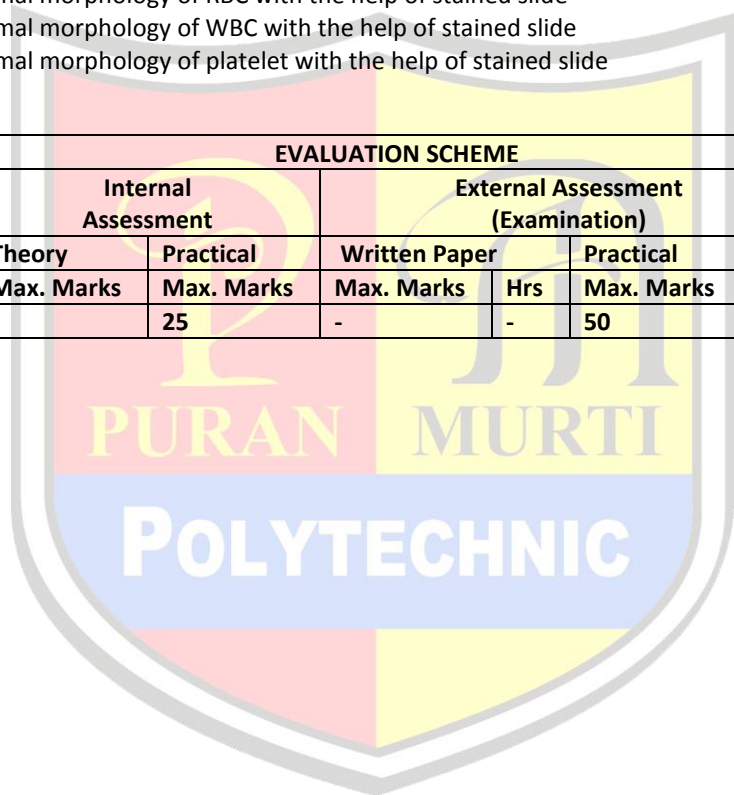
Subject: Haematology (Practical)

Subject Code: 121924(P)

LIST OF PRACTICALS

1. Preparation of peripheral blood film.
2. Preparation and standardization of stains.
3. Preparation of thick and thin blood smears.
4. Haemoglobin Estimation by Sahli's method, Oxy-Haemoglobin and Cyanmethaemoglobin method
5. Counting of RBC
6. Counting of WBC
7. Platelet counting
8. Absolute eosinophil counting
9. Study of morphology of normal RBC and WBC with the help of stained slide
10. To study abnormal morphology of RBC with the help of stained slide
11. To study abnormal morphology of WBC with the help of stained slide
12. To study abnormal morphology of platelet with the help of stained slide

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75





DETAILED CONTENTS

Unit No.1 Blood glucose/ sugar estimation, screening test and glucose tolerance test (GTT)

- Topic No.1: Metabolism of Glucose
- Topic No.2: Principle and methods of estimation
- Topic No.3: Reference values
- Topic No.4: Renal threshold
- Topic No.5: Importance and Performance of ST/GTT
- Topic No.6: Clinical importance of blood sugar, ST/GTT

Unit No.2 Blood urea

- Topic No.7: Formation and excretion of urea
- Topic No.8: Principle and procedures of different methods of urea estimation
- Topic No.9: Reference values
- Topic No.10: Clinical Importance

Unit No.3 Serum Creatinine

- Topic No.11: Introduction, principle and procedure of various estimation methods
- Topic No.12: Reference values
- Topic No.13: Clinical importance

Unit No.4 Serum proteins

- Topic No.14: Introduction
- Topic No.15: Different methods of estimation including principles and procedures
- Topic No.16: Reference values
- Topic No.17: Clinical importance

Unit No.5 Electrolytes and trace elements

- Topic No.18: Introduction, principles and procedures of estimation of Na⁺, K⁺, Cl⁻.
- Topic No.19: Reference values
- Topic No.20: Clinical importance

Unit No.6 Uric Acid

- Topic No.21: Introduction, principles and procedures of various estimation methods
- Topic No.22: Reference values
- Topic No.23: Clinical importance

Unit No.7 Quality Assurance in Biochemistry as per National Standards

- Topic No.24: **Internal quality assurance**
- Topic No.25: External quality assurance

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	125

TEXT BOOKS:

1. A Textbook of Medical Laboratory Technology by P Godkar; Bhalani Publishing House, Mumbai

REFERENCE BOOKS:

1. A Procedure Manual for Routine Diagnostic Tests Vol. I and III by KL Mukherjee; Tata McGraw Hill Publishers, New Delhi.



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SUGGESTED DISTRIBUTION OF MARKS:

Topic No.	Time allotted (Hrs)	Marks Allotted (%)
1	12	22
2	08	16
3	04	10
4	08	16
5	08	16
6	04	10
7	04	10
Total	48	100





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Subject: Clinical Biochemistry (Practical)

Subject Code: 121925(P)

LIST OF PRACTICALS

1. Preparation of reagents (stock and working)
2. Estimation of blood glucose/sugar (Folin-Wu method, O-toluidine method and enzymatic method)
3. Performance of ST/GTT
4. Serum urea estimation
5. Serum creatinine estimation
6. Serum uric acid estimation
7. Plasma and serum protein estimation
8. Estimation of electrolyte levels of Na⁺, K⁺ and Cl⁻ by colorimetric method

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		75
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	

