

Contents

MBBS I

Experiment 1: Use of Micropipettes	3
• Introduction	3
• Use	3
• Procedure for micropipetting	4
• Checking your pipetting skill	5
Experiment 2: Buffers and pH	7
• Introduction	7
• pH meter	8
Experiment 3: Qualitative tests for Carbohydrates	11
• Introduction	11
• Reactions of monosaccharides, disaccharides and polysaccharides	11
Experiment 4: Qualitative Tests for Proteins	20
• Introduction	20
• Biuret reaction (general test for protein)	20
• Heat coagulation test	21
• Precipitation by salt solution (ammonium sulfate)	21
Experiment 5: Separation of Serum Proteins by Gel Electrophoresis	25
• Introduction	25
• Principle	26
• Quantitation	27
• Hyperproteinemias	28
• Hypoproteinemias	28
Experiment 6: Principles of Colorimetry	32
• Introduction	32
• The photoelectric colorimeter	33

- Verification of Beer-Lambert's law using bromophenol blue 34

Experiment 7: Estimation of Serum Total Protein and Determination of Albumin to Globulin Ratio 38

- Introduction 38
- Principle 38
- Reagents 38
- Procedure 39
- Observation 39
- Calculation 39
- Normal range (adults) 40

Experiment 8: Genomic DNA Isolation, Amplification of the D1S80 Locus and DNA-Gel Electrophoresis 42

- Introduction 42
- Materials and methods 43
- The D1S80 locus 44
- Gel electrophoresis and DNA fragment analysis 46

Experiment 9: Estimation of Blood Glucose by GOD-POD Method 49

- Introduction 49
- Principle 49
- Specimen collection 49
- Reagents 50
- Sample collection 50
- Procedure 50
- Observation 50
- Normal range (serum/plasma glucose) 51
- Comment on the result 51

Experiment 10: Estimation of Serum Total Cholesterol by Modified Zak's Method 53

- Introduction 53
- Principle 53
- Reagents 54

• Procedure	54
• Observation	55
• Calculation	55
• Normal range for serum cholesterol (recommended by NCEP)	55
• Comment on the result	55
Experiment 11: Estimation of Serum Triglycerides	57
• Introduction	57
• Principle	57
• Procedure	57
• Observations	58
• Calculation	58
• Normal values: (A/C to NCEP-ATP II)	58
• Comment on the result	59
Experiment 12: Estimation of Serum Uric Acid by Caraway's Method	61
• Introduction	61
• Principle	61
• Reagents	62
• Procedure	62
• Observations	62
• Calculation	63
• Normal range	63
• Comment on the result	63
MBBS II	
Experiment 13: Determination of Serum Amylase Activity by Amylolytic Method	67
• Introduction	67
• Principle	67
• Reagents	68
• Procedure	68
• Normal range	69
• Comment on the result	69

Experiment 14: Estimation of Serum Aspartate Transaminase (AST) Activity 71

- Introduction 71
- Principle 71
- Reagents 72
- Procedure 72
- Observations 72
- Normal range 73
- Comment on the result 73

Experiment 15: Estimation of Serum Alanine Transaminase (ALT) Activity 75

- Introduction 75
- Principle 76
- Reagents 76
- Procedure 76
- Observations 77
- Calculation 77
- Normal range 77
- Comment on the result 78

Experiment 16: Estimation of Serum Bilirubin by Modified Jendrassik/Grof Method 80

- Introduction 80
- Principle 81
- Reagents 81
- Procedure 81
- Observations 82
- Calculation 82
- Normal range 83
- Comment on the result 83

Experiment 17: Estimation of Serum Urea by Diacetyl Mon-oxime (DAM) Method 87

- Introduction 87
- Principle 88
- Reagents 88

• Procedure	88	
• Observation	89	
• Calculation	89	
• Normal range	89	
• Comment on the result	90	
Experiment 18: Estimation of Serum Creatinine by Jaffe's Alkaline Picrate Method		91
• Introduction	91	
• Principle	91	
• Reagents	92	
• Procedure	92	
• Observation	92	
• Calculation	93	
• Normal range	93	
• Comment on the result	93	
• True creatinine	93	
Experiment 19: Urinary Creatinine (Jaffe's Method) and Creatinine Clearance		95
• Introduction	95	
• Principle	95	
• Procedure	95	
• Observation	96	
• Calculation	96	
• Normal range	97	
• Comment on the result	97	
• Normal range	98	
• Comment on the result	98	
Experiment 20: Urinalysis		101
• Introduction	101	
• Physical examination	101	
• Chemical examination	102	
• Abnormal chemical constituents	103	

Experiment 21: Urinalysis (Abnormal Constituents)	108
• Physical examination of urine	108
• Chemical examination	108
• Result	109
• Interpretation	109
Experiment 22: Oral Glucose Tolerance Test (OGTT): Principle and Interpretation	112
• Introduction	112
• Preparatory phase	112
• Procedure	113
Experiment 23: Molecular Diagnosis: Example Sickie Cell Anemia using ASO and RFLP	116
• Introduction	116
• Sickie cell anemia	116
Reference Biochemical Values	121
Reagents	122