Contents

Section 1 Hematology Experiments

1. Experiment 1: Compound Microscope **3**

Aim 3; Apparatus Required 3; Parts of the Compound Microscope 3; Total Magnification of the Compound Microscope 5; Precautions While Using the Compound Microscope 5; Other types of Microscope 5; Questions 6

2. Experiment 2: Blood Sample Collection **7**

Aim 7; Apparatus Required 7; Procedure 7; Questions 8

3. Experiment 3: Hemocytometer **9**

Aim 9; Principle 9; Apparatus Required 9; Description 9; Focusing the Counting Grid 10; Charging the Hemocytometer 10; Diluting Pipettes 11; Precautions 12; Questions 13

4. Experiment 4: Enumeration of RBC **14**

Aim 14; Apparatus Required 14; Principle 14; Procedure 14; Calculation 16; Precautions 16; Discussion 17; Result 17; Questions 18

5. Experiment 5: Estimation of Hemoglobin **19**

Aim 19; Principle 19; Apparatus Required 19; Procedure 20; Precautions 20; Result 21; Questions 21

6. Experiment 6: Packed Cell Volume and Calculation of Blood Indices **22**

Aim 22; Apparatus Required 22; Principle 22; Procedure 22; Result 23; Calculation of Blood Indices 23; Questions 24

7. Experiment 7: Determination of Erythrocyte Sedimentation Rate **26**

Aim 26; Principle 26; Methods 26; Westergren's Method 26; Wintrobe's Method 27; Discussion 28; Factors which Influence Erythrocyte Sedimentation Rate 28; Significance of Erythrocyte Sedimentation Rate in Disease 29; Physiological Variations 29; Pathological Variations 29; Factors Affecting Erythrocyte Sedimentation Rate 29; Result 29; Questions 30

8. Experiment 8: Total Leukocyte Count **31**

Aim 31; Principle 31; Apparatus Required 31; Procedure 31; Precautions 32; Calculation 33; Discussion 33; Result 34; Questions 34

9. Experiment 9: Differential Count of White Blood Cells **35**

Aim 35; Apparatus Required 35; Procedure for the Preparation of Blood Film 35; Staining the Blood Film 37; Microscopic Examination 37; Identification of the Cells 37; Results 39; Discussion 39; Normal Count 39; Variations 40; Questions 42

10. Experiment 10: Absolute Eosinophil Count **43**

Aim 43; Apparatus Required 43; Pilot's Fluid 43; Dunger's Fluid 43; Procedure 44; Calculation 44; Precautions 44; Normal Value 44; Variations 45; Result 45; Questions 46

11. Experiment 11: Determination of Bleeding Time and Clotting Time **47**

Bleeding Time Aim 47; Apparatus Required 47; Procedure 47; Discussion 47; Other Methods 48; Result 48

Clotting Time Aim 48; Apparatus Required 48; Procedure 49; Discussion 49; Other Methods 49; Result 49; Tests of Hemostasis 50; Questions 50

12. Experiment 12: Blood Grouping **52**

Synonym 52; Introduction 52; Principle 52; Apparatus and Reagents Required 53; Procedure 53; Observation and Results 53 Agglutination of Subject's Blood Group 53; Conclusion 54; Result 54; Questions 55

13. Experiment 13: Osmotic Fragility of Red Blood Cells **56**

Aim 56; Apparatus Required 56; Procedure 56; Discussion 57; Principle of this Experiment 57; Discussion 57; Significance 58; Result 58; Questions 58

14. Experiment 14: Specific Gravity of Blood **59**

Aim 59; Principle 59; Apparatus and Reagent Required 59; Preparation of Solution 59; Procedure 60; Precautions 60; Discussion 60; Physiological Variations 60; Pathological Variations 61; Result 61; Questions 61

Section 2 Clinical Physiology

15. Clinical Examination 1: General Examination **65**

General Examination: (Sample Report) 70; General Examination 70

16. Clinical Examination 2: Examination of the Respiratory System **73**

Aim 73; Inspection 73; Palpation 74; Percussion 75; Auscultation 76; Questions 79

17. Clinical Examination 3: Recording of Respiratory Movements (Stethography) **82**

Aim 82; Principle 82; Requirements 82; Procedure 82; Questions 84

18. Clinical Examination 4: Spirometry **85**

Aim 85; Procedure 85; Questions 87

19. Clinical Examination 5: Respiratory Efficiency Tests **88**

Aim 88; Requirements 88; Procedure 88; Result 89; Questions 89

20. Clinical Examination 6: Examination of the Cardiovascular System **90**

Aim 90; Anatomical Landmarks 90; Arterial Pulses 90; Method of Examining the Pulse 91; Blood Pressure 91; Venous Pulses 92; Examination of the Precordium 92; Inspection 92; Palpation 93; Percussion 93; Auscultations 93; Heart Sounds 95; Questions 96

21. Clinical Examination 7: Determination of the Blood Pressure **98**

Definition 98; Aim 98; Apparatus 98; Principle 98; Methods 98; Procedure 99; Normal Values 100; Discussion 100; Effect of Moderate Exercise on Blood Pressure 101; Questions 102

22. Clinical Examination 8: Electrocardiography **104**

Aim 104; Requirements 104; Description 104; ECG Leads 105; Direct Leads 106; Indirect Leads 106; Bipolar Chest Leads 107; Procedure 106; Calculation of Ventricular Vector (Mean Electrical Axis) 107; Questions 107

23. Clinical Examination 9: Examination of Sensory System **109**

Aim 109; Procedure 109; Tactile Sensibility 109; Pain 111; Temperature 112; Vibration 112; Sense of Position and Passive Movement 112; Stereognosis 113; Abnormal Sensation 113; Questions 114

24. Clinical Examination 10: Examination of Motor System **116**

Bulk of Muscles 116; Tone of the Muscles 117; Strength of the Muscles 117 Testing Muscles of the Upper Limb 118; Reflexes 120; Coordination of Movement 121; Gait 122; Involuntary Movements 122; Speech 123; Questions 124

25. Clinical Examination 11: Reflexes **127**

Aim 127; Superficial Reflexes 128; Deep Reflexes 129; Visceral Reflexes 131; Questions 133

26. Clinical Examination 12: Examination of Cranial Nerves I to VI **135**

Aim 135; Olfactory Nerve 135; Abnormalities 135; Optic Nerve 136; Tests 136; Oculomotor, Trochlear, and Abducent (III, IV and VI) Nerves 139; Examination of Extraocular Movements 139; Examination of the Pupil 140; Trigeminal Nerve 141; Questions 145

27. Clinical Examination 13: Examination of Cranial Nerves VII to XII **148**

Aim 148; Facial Nerve 148; Vestibulocochlear Nerve 150; Glossopharyngeal Nerve 152; Vagus Nerve 152; Accessory Nerve 153; Hypoglossal Nerve 153; Questions 155

28. Clinical Examination 14: Perimetry **159**

Aim 159; Questions 160

29. Clinical Examination 15: Cerebellar Function Tests **161**

Questions 163; Cerebellar Function Test 163;

Index *165*