Contents

1. Introduction to Microbiology 1

1.1 Understanding Microorganisms 3

2. Classification, Structure, Growth and Pathogenesis 23

2.1 Classification of Microorganisms 25
2.2 Structure of Microorganisms 38
2.3 Viruses: Structure and Life Cycle 51
2.4 Growth and Nutrition of Microorganisms 62
2.5 Microbial Reproduction 72
2.6 Bacterial Culture and Isolation Techniques 83
2.7 The Normal Flora of Human Body 98
2.8 Pathogenic Microorganisms 102
2.9 Diseases Caused by Microorganisms 111
2.10 Coronavirus Disease 2019 146

3. Infection and its Transmission 157

3.1 Infection and Transmission of Pathogenic Microorganisms 159
3.2 Nosocomial Infection 173
3.3 Collection of Specimen by Nurses 179

4. Immunity 193

4.1 Fundamentals of Immunity 195
4.2 Hypersensitivity and Autoimmunity 213
4.3 Immunoprophylaxis of Infectious Diseases and Immunization Schedule 232
4.4 Principles and Uses of Serological Tests 249

5. Control and Destruction of Microbes 261

5.1 Fundamentals of Control and Destruction of Microorganisms 263
5.2 Biosafety and Waste Management 300

6. Practical Microbiology 317

6.1 Introduction to Laboratory Techniques 319

Model Questions and Answers 351
Glossary 357
Suggested Reading 410
Index 411