peebrothers.com, for detailed information on nursing books, visit our website www.jaypeebrothers.com, for detailed information on nursing books






# Clinical Record

## for

## Post Basic BSc Nursing Course

**Name of the Institution:** _____

_____

**Name of the Candidate:** _____

C Manivannan

THIRD EDITION

JAYPEE

# Contents

## SECTION 1: General Microbiology


**1. Historical Development of Microbiology** **3**
Introduction and Scope 3
Importance and Relevance of Microorganisms 3
Importance of Microbiology in Nursing 4
The Discovery of Microorganisms 5
Scientific Development of Microbiology 5
Immunity and Immunization 6
Serotherapy and Chemotherapy 6
Branches of Microbiology 7
Nobel Prizes Awarded for Research in Microbiology 7

**2. Microscopy and Morphology of Bacteria** **11**
Microscopy 11
Light Microscopy 11
Morphology of Bacteria 13
Naming and Classifying Microorganisms 13
Nomenclature 13
Comparison of Prokaryotic Cells and Eukaryotic Cells 13
Morphology of Bacteria 14
L-Forms of Bacteria (Cell-Wall-Defective Organisms) 20

**3. Physiology of Bacteria** **22**
Principles of Bacterial Growth 22

**4. Culture Media and Culture Methods** **25**
Classification of Media 25
Culture Methods 28

**5. Infection** **31**
Sources of Infection 32
Modes of Transmission of Infection 32
Factors Predisposing to Microbial Pathogenicity 32

**6. Staining Methods** **36**
Hanging Drop Preparation 36
Staining Methods 38

Gram Stain 39
Acid-fast Stain (Ziehl–Neelsen Staining of Acid-fast Bacilli) 41
Special Stains 43
Methods for Detection for Direct Microscopic Detection of Fungi in Clinical Specimens 43

## SECTION 2: Immunology

**7. Immunity 47**
Definition 47
Classification 47
Types of Immunity 48

**8. Antigens 51**
Types of Antigen 51
Antigenic Determinant or Epitome 51
Determinants of Antigenicity 51

**9. Antibodies (Immunoglobulins) 53**
Antibody Structure 53
Immunoglobulin Classes 54
Role of Different Immunoglobulin Classes 57

**10. The Complement System 58**
Complement System 58

**11. Antigen-Antibody Reactions 62**
Uses 62
General Characteristics of Antigen-Antibody Reactions 62
Types of Antigen and Antibody Reactions 63

**12. Structure and Functions of the Immune System 74**
Types of Immune Response 74
Organs and Tissues of the Immune System 74
Cells of the Lymphoreticular System 75
Major Histocompatibility Complex 76

**13. Immune Response 78**
Definition 78
Type of Immune Response 78
Humoral Immunity 78
Monoclonal Antibodies 79

Cell-mediated Immune Responses 80
Cytokines 80
Theories of Immune Response 80

**14. Hypersensitivity Reactions 82**
Hypersensitivity 82
Classification of Hypersensitivity Reactions 82
Type I Hypersensitivity (IgE Dependent) 83
Type II Hypersensitivity: Cytolytic and Cytotoxic 84
Type III Hypersensitivity: Immune Complex-mediated 85
Type IV Hypersensitivity: Delayed Hypersensitivity 85
Type V Hypersensitivity (Stimulatory Type): Jones-Mote Reaction (or) Cutaneous Basophil Hypersensitivity 86

**15. Autoimmunity 88**
Definition 88
Mechanisms of Autoimmunity 88
Classification of Autoimmune Diseases 88

**SECTION 3: Systemic Bacteriology**

**16. Staphylococcus 93**
***Staphylococcus aureus*** 93
Coagulase-Negative Staphylococci (CONS) 97

**17. Streptococcus and Enterococcus 100**
Classification 100
*Streptococcus pyogenes* 101
Other Streptococci Pathogenic for Humans 104
*Enterococcus* 105
Viridans Streptococci 105

**18. Pneumococcus 107**
Morphology 107
Cultural Characteristics 108
Biochemical Reactions 108
Resistance 108
Antigenic Structure 108
Pathogenesis 109
Laboratory Diagnosis 109
Treatment 110

**19. Neisseria and Moraxella** **111**
*Neisseria meningitidis* 111
*Neisseria gonorrhoeae (Gonococcus)* 113

**20. Corynebacterium** **117**
*Corynebacterium diphtheriae* 117
Schick Test 120
Diphtheroids 121

**21. Bacillus** **123**
*Bacillus anthracis* 123
Anthracoid Bacilli 124
*Bacillus cereus* 125

**22. Clostridium** **127**
*Clostridium perfringens (Clostridium welchii)* 127
*Clostridium Tetani* 129
*Clostridium botulinum* 131
*Clostridium difficile* 132

**23. Nonsporing Anaerobes** **134**
Classification 134
Laboratory Diagnosis 134

**24. Mycobacterium I: Mycobacterium Tuberculosis** **136**
*Mycobacterium tuberculosis* 136

**25. Mycobacterium III: Mycobacterium Leprae** **141**
*Mycobacterium leprae* 141

**26. Nontuberculous Mycobacteria** **144**
Classification 144
Pathogenesis 145
Laboratory Diagnosis 145

**27. Actinomycetes: Actinomyces, Nocardia** **146**
*Actinomyces* 146
*Nocardia* 147

**28. Enterobacteriaceae: Escherichia, Klebsiella, Proteus, and other Genera** **149**
Characteristics of the Family *Enterobacteriaceae* 149
Classification of *Enterobacteriaceae* 149
*Escherichia coli* 149
*Edwardsville* 152

*Citrobacter* 152
*Klebsiella* 152
*Klebsiella pneumoniae* 152
*Enterobacter* 153
*Hafnia* 153
*Serratia* 153
Tribe Proteae: *Proteus, Morganella,* and *Providencia* 153
*Morganella* 154
*Providencia* 154
*Erwinia* 154

**29. Shigella 156**
Morphology 156
Cultural Characteristics 156
Antigenic Structure 156
Classification 156
Pathogenic Mechanisms 157
Laboratory Diagnosis 157
Treatment 158

**30. Enterobacteriaceae III: Salmonella 159**
*Salmonella* 159
Vaccines Against Typhoid Fever 162
*Salmonella gastroenteritis* 163

**31. Vibrio 165**
*Vibrio cholerae* 165
Halophilic Vibrios 169

**32. Campylobacter and Helicobacter 170**
*Campylobacter jejuni* and *Campylobacter coli* 170
*Helicobacter* 171

**33. *Pseudomonas, Stenotrophomonas,* and *Burkholderia* 173**
*Pseudomonas aeruginosa* 173
*Stenotrophomonas maltophilia* 174
*Burkholderia cepacia* 174
*Burkholderia mallei* 175
*Burkholderia pseudomallei* 175

**34. Legionella 176**
*Legionella pneumophila* 176

**35. *Yersinia, Pasteurella* and *Francisella*** **178**
*Yersinia pestis* 178
*Yersinia pseudotuberculosis* 179
*Yersinia enterocolitica* 180

**36. Haemophilus** **181**
*Haemophilus influenzae* 181
*Haemophilus ducreyi* 183

**37. Bordetella** **185**
*Bordetella pertussis* 185

**38. Brucella** **187**

**39. Spirochetes** **190**
*Treponema* 190
*Borrelia* 195
*Borrelia vincentii (Treponema vincentii)* 196
*Leptospira* 197

**40. *Mycoplasma* and *Ureaplasma*** **200**
Classification 200
Morphology 200
Cultural Characteristics 200
Pathogenicity 201
Laboratory Diagnosis 201
Treatment 202

**41. Miscellaneous Bacteria** **204**
*Listeria monocytogenes* 204
*Erysipelothrix rhusiopathiae* 205
*Alcaligenes faecalis* 205
*Chromobacterium violaceum* 205
*Flavobacterium meningosepticum* 205
Donovania Granulomatis *(Calymmatobacterium granulomatis)* or *Klebsiella granulomatis* 205
*Acinetobacter (Mima polymorpha; Bacterium anitratum)* 206
Rat Bite Fever *(Streptobacillus moniliformis* and *Spirillum minus)* 206
*Gardnerella vaginalis* 206

**42. Rickettsiaceae, Bartonellaceae, and Coxiella** **208**
Classification 208
Genus *Rickettsia* 208

Genus *Orientia* 209
Genus *Ehrlichia* 210
Genus *Coxiella*: Q Fever 211
*Bartonella* 211

**43. *Chlamydia* and *Chlamydophila* 213**
*Chlamydia* 213
*Chlamydia trachomatis* 214
*Chlamydophila psittaci* 215

## SECTION 4: Virology

**44. General Properties of Viruses 219**
Main Properties of Viruses 219
Morphology of Viruses 219
Structure and Chemical Composition of the Viruses 220
Cultivation of Viruses 220
Detection of Virus Growth in Cell Culture 222
Classification of Viruses 222

**45. Laboratory Diagnosis, Prophylaxis, and Chemotherapy of Viral Diseases 224**
Laboratory Diagnosis of Viral Infections 224
Immunoprophylaxis of Viral Diseases 224
Chemoprophylaxis and Chemotherapy of Virus Diseases 225

**46. DNA Viruses 226**
Poxviruses 226
Herpes Viruses 227
Varicella-Zoster Virus 229
Cytomegalovirus 230
Epstein–Barr Virus 230
Adenoviruses 231
Papovaviruses 232
Papillomaviruses 232
Polyomaviruses 232
Parvovirus 232
Hepatitis B Virus 232

**47. Hepatitis Viruses 234**
Type A Hepatitis (Infectious Hepatitis) 234

Hepatitis B Virus (Serum Hepatitis) 235
Hepatitis Type C 238
Type D (Delta) Hepatitis 238
Hepatitis E Virus 239
Hepatitis G Virus 239
Non-A, Non-B (NANB) Hepatitis 239

**48. RNA Viruses 241**
Picornaviruses 241
Poliovirus 241
Orthomyxovirus 242
Paramyxoviruses 244
Rhabdoviruses 245
Rabies Virus 245
Arboviruses 247
Alphavirus 247
Flavivirus 247
Rubella (German Measles) 248
Congenital Rubella 248
Rotaviruses 248

**49. Retroviruses: Human Immunodeficiency Virus 251**
Human Immunodeficiency Virus 251

**SECTION 5: Medical Mycology**

**50. General Properties, Classification and Laboratory Diagnosis of Fungi 259**
General Properties of Fungi 259
Classification of Fungi 259
Laboratory Diagnosis 260
Mycoses (Fungus Infections) 260

**51. Superficial, Cutaneous and Subcutaneous Mycoses 262**
Superficial Mycoses 262
Cutaneous Mycoses 262
Subcutaneous Mycoses 263

**52. Systemic Mycoses 266**

**53. Opportunistic Mycoses 270**
Opportunistic Fungi 270
Yeast-like Fungi 270

Cryptococcosis 272
Aspergillosis 273
Mucormycoses (Zygomycosis, Systemic Phycomycosis) 273
Penicilliosis 273
Pneumocystosis 274

## SECTION 6: Medical Parasitology

**54. Protozoology 279**
Classification of Parasites 279
Protozoa 279
*Entamoeba histolytica* 280
*Entamoeba coli* 283
Flagellates 283
*Giardia lamblia (Giardia intestinalis)* 284
*Trichomonas* 285
*Trichomonas vaginalis* 285
Hemoflagellates 286
*Leishmania donovani* 286
Sporozoa 288

**55. Helminthology 294**
**Cestodes** 294
*Taenia saginata* 294
*Taenia solium* 295
Genus *Echinococcus* 298
**Nematodes** 301
*Ascaris lumbricoides*—The Common Roundworm 301
*Ancylostoma duodenale* 303
*Necator americanus* 305
Visceral Larva Migrans 306
*Enterobius vermicularis* 306
*Wuchereria bancrofti* 307
Trematodes 310

## SECTION 7: Miscellaneous

**56. Infective Syndrome* 315**
Meningitis 315
Urinary Tract Infections 317

Sore Throat 317
Diarrhea 317
Dysentery 318
Food Poisoning 318
Sexually Transmitted Diseases 319
Pyrexia of Unknown Origin 319

**57 Laboratory Control of Antimicrobial Therapy 321**
Antibiotic Sensitivity Tests 321

**58. Normal Microbial Flora of the Human Body 324**
Normal Flora of the Skin 324
Normal Flora of the Conjunctiva 324
Normal Flora of the Nose, Nasopharynx and Accessory Sinuses 324
Normal Flora of the Mouth 324
Normal Flora of the Upper Respiratory Tract 325
Normal Flora of the Gastrointestinal Tract 325
Normal Flora of the Genitourinary Tract 325

**59. Antimicrobial Chemotherapy 327**
Antibacterial Agents 327
Mechanisms of Action of Antibacterial Drugs 327
Resistance to Antimicrobial Drugs 329

**60. Immunoprophylaxis 331**
Immunizing Agents 331
The Cold Chain 332
Immunization 332

**61. Vehicles, Vectors and Rodents 337**
Vehicles and Vectors 337
Vehicle-Borne 337
Vector-Borne 337
Rodents 338

**62. Pathogenesis and Common Diseases 340**
Common Diseases Caused by Different Microorganisms 340
Human Diseases Caused by Bacteria 340

**SECTION 8: Infection Control and Safety**

**63. Healthcare-associated Infections 351**
Sources of Infections 351

Routes of Transmission 351
Microorganisms Causing Healthcare-associated Infections (HAIs) 352
Types of Healthcare–associated Infections 352
Diagnosis and Control of Hospital Infection 353
Infection Control Policy 354
Prevention of Hospital-associated Infections 354

**64. Isolation Precautions and use of Personal Protective Equipment 358**
Isolation Technique 358
Standard Precautions in Health Care 358
Standard Precautions 362
Personal Protective Equipment 364

**65. Hand Hygiene 368**
Hand Hygiene: Why, How and When? 368
Hand Wash 369
Hand Rub 369
Improving the Implementation of Hand Hygiene 369
Your 5 Moments for Hand Hygiene 369

**66. Sterilization and Disinfection 376**
Methods of Sterilization and Disinfection 376
Cleaning 385
Asepsis 386
Spaulding's Classification 386

**67. Specimen Collection (Review) 389**
Specimens 389
Universal Precautions 389
Collection of Specimens 390
Transport of Specimens 392
Health and Safety Precautions 392

**68. Biomedical Waste Management 393**
Definition of Biomedical Waste 393
Categories of Biomedical Waste 393
Waste Segregation 394
Biomedical Waste Management in India 399
Laundry Management Process and Infection Control and Prevention 399

**69. Antibiotic Stewardship 401**
Antimicrobial Stewardship 401
Goal of Antimicrobial Stewardship 401

Need of Antimicrobial Stewardship 401
Implementing an Antimicrobial Stewardship Program 401
Monitoring of Antimicrobial Stewardship Program 402
Rational use of Antibiotics 403
Antimicrobial Resistance 404
Methicillin-resistant *Staphylococcus aureus* 405
Multidrug Resistant Organisms 406

**70. Patient Safety Indicators 409**
Care of Vulnerable Patients 409
Prevention of Iatrogenic Injury 410
Care of Lines, Drains and Tubing's 411
Restraint Policy and Care: Physical and Chemical 411
Blood and Blood Transfusion Policy 412
Prevention of Intravenous Complications 413
Fall Prevention 414
Prevention of Deep Vein Thrombosis 414
Shifting and Transport of Patients 414
Surgical Safety 415
Care Coordination Event Related to Medication Reconciliation and Administration 415
Prevention of Communication Errors 415
Documentation 417

**71. Incidents and Adverse Events 419**
Capturing of Incidents 419
Root Cause Analysis 420
Report Writing 421

**72. International Patient Safety Goals 423**
Applications of International Patient Safety Goals in the Patient Care System 423

**73. Safety Protocol 426**
High 5s Project 426
Radiation Safety 427
Laser Safety 427
Fire Safety 428
HAZMAT (Hazardous Materials) Safety 429
Spill 429
Material Safety Data Sheet or Safety Data Sheet 430

Environment, Health and Safety 430
Emergency Codes 432
Role of Nurse in Times of Disaster 433

**74. Employee Safety Indicators 436**
Fall Prevention 436
Annual Health Checkup 437

**75. Healthcare Worker Immunization and Management of Occupational Exposure 439**
Occupational Health and Safety Legislation in India 439
Occupational Health Program 439

*Index* 445

SECTION 2

# Immunology

**SECTION OUTLINE**

7. Immunity
8. Antigens
9. Antibodies (Immunoglobulins)
10. The Complement System
11. Antigen–Antibody Reactions
12. Structure and Functions of the Immune System
13. Immune Response
14. Hypersensitivity Reactions
15. Autoimmunity

JAYPEE BROTHERS

CHAPTER 7

# Immunity

## Learning Objectives

**After reading and studying this chapter, you should be able to:**

- Describe innate immunity, artificial active immunity, natural passive immunity, and herd immunity.
- Differentiate between active and passive immunity.

## DEFINITION

**Immunity** refers to the resistance exhibited by the host toward injury caused by microorganisms and their products.

The complex reaction a host animal undergoes after contact with microorganisms can be grouped under the broadly defined heading of **resistance.**

## CLASSIFICATION

Immunity against infectious diseases is of different types. The discrimination between self and nonself, and the subsequent destruction and removal of foreign material, is accomplished by two arms of immune system, the **innate** (or "**natural")** **immune system,** and the **adaptive** (or "**acquired"), specific immune system**.

## IMMUNITY

### Innate or Natural Immunity

It is the resistance to infections which an individual possesses by virtue of his genetic or constitutional make up. Repeated exposure to a pathogen does not enhance the innate immune system.

#### *Nonspecific and Specific Immunity*

It may be **nonspecific**, when it indicates a degree of resistance to infections in general, or **specific** where resistance to a particular pathogen is concerned. Innate immunity may be considered at the level of **species, race or individual.**

#### *Mechanisms of Innate Immunity*

1. **Mechanical barriers and surface secretions:**
   A. **Skin:** The intact skin and the mucous membranes provide mechanical barriers. Secretions from the sebaceous glands contain both saturated and unsaturated fatty acids that kill many bacteria and fungi.
   B. **Mucous membrane:**
   **General protective mechanisms:** A major protective component of mucous membranes is the **mucus** itself.
   **Specific protective characteristics:**
      i. **Mouth or oral cavity:** The mouth or oral cavity is protected by the flow of saliva that physically carries microorganisms away from the cell surfaces and also contains the lysozyme, which destroys bacterial cell walls, and antibodies.
      ii. **Gastrointestinal tract:** The low pH and proteolytic enzymes of the stomach help to keep the numbers of microorganisms low. In the **small intestine**, protection is provided by the presence of bile salts.
      iii. **Upper respiratory tract:** Cough reflex is an important defense mechanism

JAYPEE BROTHERS

of the respiratory tract. Nasal and respiratory secretions contain **mucopolysaccharide** capable of combining with influenza and certain other viruses.

iv. **Genitourinary tract:**
   a. **Normal flow of urine: The normal flow of urine** flushes the urinary system.
   b. **Spermine and zinc:** Spermine and zinc present in the semen carry out antibacterial activity.
   c. **Acidity of the adult vagina:** The low pH (acidity) of the adult vagina provides an inhospitable environment for colonization by pathogens.

v. **Conjunctiva:** Conjunctiva is continually being assaulted by microbe-laden dust and is kept moist by the continuous flushing action of tears (lachrymal fluid). Tears contain the antibacterial substance lysozyme.

2. **Antibacterial substances in blood and tissues:** Many microbial substances are present in the tissue and body fluids. These are nonspecific:
   - Complement system
   - Other substances.
3. **Microbial antagonisms:** The skin and mucous surfaces have resident bacterial flora which prevent colonization by pathogens.
4. **Cellular factors in innate immunity:** Natural defense against the invasion of blood and tissues by microorganisms and other foreign particles is mediated to a large extent by phagocytic cells which ingest and destroy them.
5. **Inflammation:** If the surface chemical and physiologic defenses of the body are breached by a pathogen, inflammation can result, which is an important, nonspecific defense mechanism.
6. **Fever:** Following infection a rise of temperature is a natural defense mechanism.
7. **Acute phase proteins:** A sudden increase in the plasma concentration of certain proteins, collectively termed "**acute phase proteins"** occurs as a result of infection or tissue injury.

## TYPES OF IMMUNITY

### Acquired Immunity

Acquired immunity refers to the resistance that an individual acquires during his lifetime. Acquired immunity is of two types: active immunity, and passive immunity **(Table 7.1)**.

#### *A. Active Immunity*

Active immunity is induced after contact with foreign antigens.

**Immune response:**

A. **The primary response:** Active immunity sets in only after a **latent period.** There is often a **negative phase.** Once developed, the active immunity is **long lasting.**
B. **Secondary response:** If an individual who has been actively immunized against an antigen, experiences the same antigen

**Table 7.1: Comparison of active and passive immunity.**

| *Active immunity* | *Passive immunity* |
|---|---|
| • Produced actively by host's immune system | • Received passively. No active host participation |
| • Induced by infection or by immunogens | • Readymade antibody transferred |
| • Durable effective protection | • Transient, less effective |
| • Immunity effective only after lag periode, i.e., time required for generation of antibodies and immunocompetent cells | • Immediate immunity |
| • Immunological memory present | • No memory |
| • Booster effect on subsequent dose | • Subsequent dose less effective |
| • "Negative phase" may occur | • No negative phase |
| • Not applicable in the immunodeficient | • Applicable in immunodeficient |

JAYPEE BROTHERS

subsequently, the immune response occurs more quickly and abundantly than during the first encounter. This is known as **secondary response.**

*Types of active immunity:*

1. **Natural active immunity:** Natural active immunity results from either a clinical or an inapparent infection by a microbe. Such immunity is usually **long lasting**. The immunity is **life-long** following many viral diseases such as chickenpox or measles.
2. **Artificial active immunity:** Artificial active immunity is the resistance induced by vaccines. **Vaccines** are preparations of live or killed microorganisms or their products used for immunization. Vaccines are made with either (1) live, attenuated microorganisms; (2) killed microorganisms; (3) microbial extract; (4) vaccine conjugates; or (5) inactivated toxoids.
   Both bacterial and viral pathogens are targeted by these diverse means.

*Examples of Vaccines*

1. **Bacterial vaccines**
   a. Live (BCG vaccine for tuberculosis)
   b. Killed (Cholera vaccine)
   c. Subunit (Typhoid Vi antigen)
   d. Bacterial products (Tetanus toxoid)
2. **Viral vaccines**
   a. *Live*
      - Oral polio vaccine—Sabin
      - 17D vaccine for yellow fever
      - MMR vaccine for measles, mumps, rubella
   b. *Killed:* Injectable polio vaccine—Salk
      - Neural and nonneural vaccines for rabies
      - Hepatitis B vaccine
   c. *Subunit:* Hepatitis B vaccine

### *B. Passive Immunity*

The immunity that is transferred to a recipient in a "readymade" form is known as **passive immunity**.

*Main advantage of passive immunity:*

i. The prompt availability of large amount of antibody.
ii. It is employed where **instant immunity** is required because of its immediate action.

#### 1. Natural Passive Immunity

This is the resistance passively transferred from mother to baby through the placenta. After birth, immunoglobulins are passed to the newborn through the **breast milk.** The **human colostrum**, is rich in IgA antibodies which gives protection to the neonate up to 3 months of age.

#### 2. Artificial Passive Immunity

Artificial passive immunity is the resistance passively transferred to a recipient by the administration of antibodies. The agents used for this purpose are pooled human gamma globulin, hyperimmune sera of animal or human origin and convalescent sera. These are used for prophylaxis and therapy.

*Indications of passive immunization:*

1. **To provide immediate protection**—to a nonimmune host exposed to an infection and lack active immunity to that pathogen and when there is insufficient time for active immunization to take effect.
2. **Treatment of some infections.**
3. **For the suppression of active immunity**—when it may be injurious, e.g., administration of anti-Rh (D) IgG to Rh-negative mother, bearing Rh-positive baby at the time of delivery to prevent isoimmunization.
4. **Immunocompromised or immunodeficient individuals,** e.g., children with hypogammaglobulinemia, individuals with AIDS, patients receiving chemotherapy, organ transplant recipients receiving immunosuppressive therapy.

#### Combined Immunization

Combined immunization is a combination of active and passive methods of immunization which is sometimes employed. For example, it is often undertaken in some diseases such as tetanus, diphtheria, and rabies. Passive immunity provides the protection necessary till the active immunity becomes effective.

JAYPEE BROTHERS

### *Local Immunity*

Local immunity is conferred by secretory immunoglobulin A (*secretory IgA*) produced locally by plasma cells present on mucosal surfaces or in secretory glands. There appears to be a selective transport of such antibodies between the various mucosal surfaces and secretory glands.

*Examples*

1. **Poliomyelitis immunization**
2. **Influenza immunization**

### *Herd Immunity*

It is the level of resistance of a community or a group of people to a particular disease and is relevant in the control of epidemic diseases.

**High level of herd immunity**: Eradication of communicable diseases depends on the development of a high level of herd immunity rather than on the development of a high level of immunity in individuals.

## KEY POINTS

- Innate or natural immunity—is the resistance to infections which an individual possesses by virtue of his genetic or constitutional make up.
- Acquired immunity refers to the resistance that an individual acquires during his lifetime.
- Artificial active immunity is the resistance induced by vaccines.

## IMPORTANT QUESTIONS

1. Tabulate the differences between active and passive immunity.
2. Write short notes on:
   a. Innate immunity
   b. Active immunity
   c. Passive immunity

## MULTIPLE CHOICE QUESTIONS

1. **All are acute phase proteins, *except*:**
   a. C-reactive protein
   b. Mannose binding protein
   c. Serum amyloid P component
   d. Antibody
2. **Clinical or inapparent infection leads to:**
   a. Natural active immunity
   b. Artificial active immunity
   c. Natural passive immunity
   d. Artificial passive immunity
3. **Vaccine induces:**
   a. Active natural immunity
   b. Active artificial immunity
   c. Passive natural immunity
   d. Passive artificial immunity
4. **All the following statements are true for artificial passive immunity, *except*:**
   a. Artificial passive immunity is the resistance passively transferred to a recipient by the administration of antibodies
   b. It is short lived and lasts only a few weeks to a few months
   c. This type of immunity is immediate
   d. This immunity may be induced by maternal antibodies
5. **All of the following are live vaccines, *except:***
   a. BCG
   b. MMR
   c. Sabin vaccine
   d. TAB vaccine
6. **All of the following are killed vaccines, *except*:**
   a. Salk vaccine
   b. Nonneural vaccines for rabies
   c. Hepatitis B vaccine
   d. BCG

### ANSWERS

**1. d** **2. a** **3. b** **4. d**
**5. d** **6. d**

JAYPEE BROTHERS

for detailed information on nursing books, visit our website www.jaypeebrothers.com, for detailed information on nursing books, visit our website

# Clinical Record

for

Post Basic BSc Nursing Course

The Clinical Record prepared for PB BSc Nursing Course is based on the curriculum formulated by Indian Nursing Council (INC). This record will help the students to acquire clinical knowledge in each specialty areas with which the students can demonstrate appropriate skills in all these clinical areas. It will help the teachers to monitor the students' clinical performance and the needed guidelines can be provided.

**C Manivannan** MSc (N) MSc (Psy) MPhil (Psy) PhD (N) is working as a Principal in Shri Bharani College of Nursing, Salem, Tamil Nadu, India. He is the author of many books and also an active member in the nursing profession. He has wide experience and knowledge in both theoretical and practical aspects in the nursing profession. He has been teaching pediatric nursing and community health nursing for many years. He has been involved in various academic activities and published interesting articles in various journals.

**Available at all medical bookstores**
**or buy online at www.jaypeebrothers.com**




**JAYPEE BROTHERS**
**Medical Publishers (P) Ltd.**
**www.jaypeebrothers.com**

Join us on facebook.com/JaypeeMedicalPublishers

