

# Setting Up Wireless Network BCA(N)- 123

## Block - I PHYSICS

### UNIT –I RADIO PHYSICS

- 1.1 What is a wave?
- 1.2 Electromagnetic forces
- 1.3 Symbols of the international system of units
- 1.4 Phase
- 1.5 Polarization
- 1.6 The electromagnetic spectrum
- 1.7 Bandwidth
- 1.8 Frequencies and channels
- 1.9 Behaviour of radio waves
- 1.10 The Huygens Principle
- 1.11 Absorption
- 1.12 Reflection
- 1.13 Diffraction
- 1.14 Interference
- 1.15 Line of sight
- 1.16 Understanding the Fresnel zone
- 1.17 Power
- 1.18 Physics in the real world
- 1.19 Check your progress
- 1.20 Answer Check your progress
- 1.21 Model Question
- 1.22 References
- 1.23 Suggested readings

### Unit – 2 TELECOMMUNICATIONS BASICS

- 2.1 Modulation
- 2.2 Multiplexing and duplexing
- 2.3 Conclusions
- 2.4 Check your progress
- 2.5 Answer Check your progress
- 2.6 Model Question
- 2.7 References
- 2.8 Suggested readings

### Unit – 3 LICENSING AND REGULATION

- 3.1 Examples of relevant types of regulation
- 3.2 Check your progress

- 3.3 Answer Check your progress
- 3.4 Model Question
- 3.5 References
- 3.6 Suggested readings

#### **Unit – 4 RADIO SPECTRUM**

- 4.1 What is the electromagnetic spectrum?
- 4.2 How is the spectrum adjudicated?
- 4.3 Political issues
- 4.4 Explosion in spectrum demand
- 4.5 Spectrum scarcity or spectrum hoarding?
- 4.6 IEE 802.22
- 4.7 Developing countries advantage
- 4.8 Check your progress
- 4.9 Answer Check your progress
- 4.10 Model Question
- 4.11 References
- 4.12 Suggested readings

#### **Unit – 5 ANTENNAS / TRANSMISSION LINES**

- 5.1 Cables
- 5.2 Waveguides
- 5.3 Connectors and adapters
- 5.4 Antenna term glossary
- 5.5 Types of antennas
- 5.6 Reflector theory
- 5.7 Amplifiers
- 5.8 Practical antenna designs
- 5.9 Antenna measurements
- 5.10 Check your progress
- 5.11 Answer Check your progress
- 5.12 Model Question
- 5.13 References
- 5.14 Suggested readings

### **Block – 2 NETWORKING**

#### **Unit – 6 NETWORKING**

- 6.1 Introduction
- 6.2 Cooperative communications
- 6.3 The OSI model
- 6.4 The TCP/IP model
- 6.5 The Internet Protocols
- 6.6 Internet Protocol Suite
- 6.7 Physical hardware

- 6.8 Putting it all together
- 6.9 Designing the physical network
- 6.10 Check your progress
- 6.11 Answer Check your progress
- 6.12 Model Question
- 6.13 References
- 6.14 Suggested readings

## **Unit - 7 WIFI FAMILY**

- 7.1 IEEE 802: What is it, and why should I care?
- 7.2 The 802.11 standard
- 7.3 Deployment planning for 802.11 wireless networks
- 7.4 The 802.22 Standard
- 7.5 Summary
- 7.6** Check your progress
- 7.7 Answer Check your progress
- 7.8 Model Question
- 7.9 References
- 7.10 Suggested readings

## **Unit - 8 MESH NETWORKING**

- 8.1 Introduction
- 8.2 Bandwidth impact of multi-hop relaying routes
- 8.3 Summary
- 8.4 Routing protocols for mesh networks
- 8.5 Devices and firmware for embedded devices
- 8.6 Frequently observed problems
- 8.7 Check your progress
- 8.8 Answer Check your progress
- 8.9 Model Question
- 8.10 References
- 8.11 Suggested readings

## **Unit - 9 SECURITY FOR WIRELESS NETWORKS**

- 9.1 Introduction
- 9.2 Protecting the wireless network
- 9.3 Physical security for wireless networks
- 9.4 Authentication and access control
- 9.5 Summary
- 9.6 802.1X
- 9.7 Inter-organisational roaming
- 9.8 End to end encryption
- 9.9 Tor & Anonymizers
- 9.10 Check your progress
- 9.11 Answer Check your progress

- 9.12 Model Question
- 9.13 References
- 9.14 Suggested readings

## **Block – 3 PLANNING AND DEPLOYMENT**

### **Unit - 10 DEPLOYMENT PLANNING**

- 10.1 Estimating capacity
- 10.2 Calculating the link budget
- 10.3 Link planning software
- 10.4 Avoiding noise
- 10.5 Repeaters
- 10.6 Deployment planning for IPv6
- 10.7 Check your progress
- 10.8 Answer Check your progress
- 10.9 Model Question
- 10.10 References
- 10.11 Suggested readings

### **Unit - 11 HARDWARE SELECTION AND CONFIGURATION**

- 11.1 Wired wireless
- 11.2 Choosing wireless components
- 11.3 Commercial vs. DIY solutions
- 11.4 Professional lightning protection
- 11.5 Access Point Configuration
- 11.6 Configure the client
- 11.7 Hints - working outdoors
- 11.8 Troubleshooting
- 11.9 Check your progress
- 11.10 Answer Check your progress
- 11.11 Model Question
- 11.12 References
- 11.13 Suggested readings

### **Unit - 12 INDOOR INSTALLATION**

- 12.1 Introduction
- 12.3 Preparations
- 12.4 Bandwidth requirements
- 12.5 Frequencies and data rates
- 12.6 Access Points choice and placement
- 12.7 SSID and Network Architecture
- 12.8 Post Installation
- 12.9 Check your progress
- 12.10 Answer Check your progress
- 12.11 Model Question

- 12.12 References
- 12.13 Suggested readings

### **Unit - 13 OUTDOOR INSTALL**

- 13.1 What is needed for a long distance link?
- 13.2 Antenna alignment
- 13.3 Check your progress
- 13.4 Answer Check your progress
- 13.5 Model Question
- 13.6 References
- 13.7 Suggested readings

### **Unit - 14 OFF-GRID POWER**

- 14.1 Solar Power
- 14.2 Photovoltaic system components
- 14.3 The solar panel
- 14.4 The battery
- 14.5 Temperature effects
- 14.6 The charge regulator
- 14.7 Converters
- 14.8 Equipment or load
- 14.9 Orientation of the panels
- 14.10 How to size your photovoltaic system
- 14.11 Data to collect
- 14.12 Electrical characteristics of system components
- 14.13 Procedure of calculation
- 14.14 Cables
- 14.15 Cost of a solar installation
- 14.16 Check your progress
- 14.17 11 Answer Check your progress
- 14.18 Model Question
- 14.19 References
- 14.20 Suggested readings

## **Block – 4 MAINTENANCE, MONITORING AND SUSTAINABILITY**

### **Unit - 15 MAINTENANCE AND TROUBLESHOOTING**

- 15.1 Introduction
- 15.2 Building your team
- 15.3 Proper troubleshooting techniques
- 15.4 Common network problems
- 15.5 Trouble tracking and reporting
- 15.6 Check your progress
- 15.7 Answer Check your progress
- 15.8 Model Question

- 15.9 References
- 15.10 Suggested readings

## **Unit - 16 NETWORK MONITORING**

- 16.1 Introduction
- 16.2 Network monitoring example
- 16.3 Detecting network outages
- 16.4 Monitoring your network
- 16.5 Types of monitoring tools
- 16.6 Network detection
- 16.7 Spot check tools
- 16.8 Protocol analysers
- 16.9 Trending tools
- 16.10 Throughput testing
- 16.11 Realtime tools and intrusion detection
- 16.12 Other useful tools 329
- 16.13 What is normal?
- 16.14 Establishing a baseline
- 16.15 Monitoring RAM and CPU usage
- 16.16 Summary
- 16.17 Check your progress
- 16.18 Answer Check your progress
- 16.19 Model Question
- 16.20 References
- 16.21 Suggested readings

## **Unit - 17 ECONOMIC SUSTAINABILITY**

- 17.1 Introduction
- 17.2 Create a mission statement
- 17.3 Evaluate the demand for potential offerings
- 17.4 Establish appropriate incentives
- 17.5 Research the regulatory environment for wireless
- 17.6 Analyse the competition
- 17.7 Determine initial and recurring costs and pricing
- 17.8 Categories of Costs
- 17.9 Secure the financing
- 17.10 Evaluate the strengths and weaknesses of the internal situation
- 17.11 Putting it all together
- 17.12 Conclusion
- 17.13 Check your progress
- 17.14 Answer Check your progress
- 17.15 Model Question
- 17.16 References
- 17.17 Suggested readings