Question 17.1

LAN extension: a wireless LAN integrated with a wired LAN to extend the coverage area of the LAN complex.

Cross-building interconnect: wireless point-to-point link for two LANs.

Nomadic access: provides a wireless link between a LAN hub and a mobile data terminal equipped with an antenna, such as a laptop computer or notepad computer.

Ad-Hoc network: a peer-to-peer network (no centralized server) set up temporarily to meet some immediate need.

Question 17.2

Throughput: The medium access control protocol should make as efficient use as possible of the wireless medium to maximize capacity.

Number of nodes: Wireless LANs may need to support hundreds of nodes across multiple cells.

Connection to backbone LAN: In most cases, interconnection with stations on a wired backbone LAN is required. For infrastructure wireless LANs, this is easily accomplished through the use of control modules that connect to both types of LANs. There may also need to be accommodation for mobile users and ad hoc wireless networks.

Service area: A typical coverage area for a wireless LAN has a diameter of 100 to 300 m.

Battery power consumption: Mobile workers use battery-powered workstations that need to have a long battery life when used with wireless adapters. This suggests that a MAC protocol that requires mobile nodes to monitor access points constantly or engage in frequent handshakes with a base station is inappropriate. Typical wireless LAN implementations have features to reduce power consumption while not using the network, such as a sleep mode.

Transmission robustness and security: Unless properly designed, a wireless LAN may be interference prone and easily eavesdropped. The design of a wireless LAN must permit reliable transmission even in a noisy environment and should provide some level of security from eavesdropping.

Collocated network operation: As wireless LANs become more popular, it is quite likely for two or more wireless LANs to operate in the same area or in some area where interference between the LANs is possible. Such interference may thwart the normal operation of a MAC algorithm and may allow unauthorized access to a particular LAN.

License-free operation: Users would prefer to buy and operate wireless LAN products without having to secure a license for the frequency band used by the LAN.

Handoff/roaming: The MAC protocol used in the wireless LAN should enable mobile stations to move from one cell to another.

Dynamic configuration: The MAC addressing and network management aspects of the LAN should permit dynamic and automated addition, deletion, and relocation of end systems without disruption to other users.

Question 17.3

Single-cell wireless LAN: all of the wireless end systems are within range of a single control module. Multiple-cell wireless LAN: there are multiple control modules interconnected by a wired LAN; each control module supports a number of wireless end systems within its transmission range.

Question 17.7

An **access point** functions as a bridge to enable the linking of multiple separate 802.11 wireless LANs. A **portal** provides an interconnection point between an 802.11 wireless LAN and a wired LAN.

Problem 17.1

medium busy	PIFS	From AP beacon w/CF info element	SIFS	To A Data+CF-Poll	SIFS	To AP Data+CF-Ack	SIFS	To B Data+CF-Ack+CF-Poll	SIFS	To AP Data+CF-Ack	SIFS	To C CF-Poll	SIFS	To AP Null	SIFS	From AP CF-End