Answer Key for Exam 2

1.. WiFi nodes will listen before transmitting, and will not transmit if someone else is transmitting. If a collision nevertheless occurs (e.g., because two WiFi hosts can each receive signals from the access point, but not each other), that will be detected because no acknowledgment will be received (WiFi includes link-level acknowledgements). The sender will then wait a random amount of time and then retransmit (the randomness minimizes the chance that two senders will choose the same wait time before retransmitting). There is also a Request To Send / Clear To Send (RTS/CTS) option that is less often used (because it slows things down in most cases) that can limit the possibility of collisions (and thus could be an answer to the first half of the question). It was also possible to answer in the context of what would happen if two different wireless access points were interfering with each other, but only partial credit was possible for mentioning that the system might automatically change frequencies (because some collisions will remain possible even with a single wireless access point).

2. A sequence number that indicates the starting byte point is included in each packet, along with a length that indicates how many bytes the packet contains. The he receiving TCP program uses this information to keep track of which bytes have been received. If later bytes are received before earlier ones, the TCP application can either keep them (and simply wait for the earlier ones to arrive) or it can discard them (in which case the later bytes would eventually be retransmitted).

3. The sender will not receive an acknowledgement for the dropped packet and, after the timeout expires, it will retransmit that packet.

4. Routing table from F

A	E	11
B	E	13
C	E	9
D	E	5
E	E	3
G	G	19

5. There are many possible answers to this question. Some good answers for US policy (internet providers have no responsibility for the content sent using their network) include incentivizing the creation of network services (by reducing legal liability), fostering innovation (because the network can be used in ways that could not be anticipated when the filtering requirements were designed), or enhancing availability by reducing costs (because filtering specific content might be expensive). Some good answers for Chinese policy (Internet providers are required to filter some types of content or content from some types of sources) include preservation of social stability (e.g,. by preventing antisocial messages from reaching a broad audience) and suppression of criminal or terrorist activity (e.g., by limiting the use of the network for recruiting or coordination).

6. Public Key encryption is used to communicate with the certification authority, to authenticate the identity of participants, and to exchange the master secret from which the session key for the symmetric key encryption is derived.

7. As one example of a possible answer, a typical high-quality video file might be about 2.4 GB per hour, which works out to about 40 MB per minute. A tolerable initial delay before replay starts might be 10 seconds or so, which works out to about 7 MB of storage for the initial buffered content. Many possible

answers were possible; the key is to be reasonable in your choice of examples, and consistent with those examples in computing your answer.