Problem #1

*If the passenger is analogous to a datagram, what is analogous to the link layer frame?*

The link layer frame would be the object that encapsulates the passenger, just as the frame encapsulates the datagram. In this example it would be the transportation mode: limousine, plane, and train.

Problem #2

*In Section 5.3, we listed four desirable characteristics of a broadcast channel. Which of these characteristics does slotted ALOHA have? Which of these characteristics does token passing have?*

Aloha:

* When only one node has data to send, that node has a throughput of R bps.
* The protocol is decentralized; that is, there is no master node that represents a single point of failure for the network.
* The protocol is simple, so that is inexpensive to implement.

Token passing:

* When only one node has data to send, that node has a throughput of R bps.
* When M nodes have data to send, each of these nodes has a throughput of R/M bps. This need not necessarily imply that each of the M nodes always has an instantaneous rate of R/M, but rather that each node should have an average transmission rate of R/M over some suitably defined interval of time.
* The protocol is decentralized; that is, there is no master node that represents a single point of failure for that network.
* The protocol is simple, so that it is inexpensive to implement.

Problem #5

*In this problem, we explore some of the properties of the CRC. For the generator G(=1001) given in Section 6.2.3, answer the following question.*

1. *Why can it detect any single bit error in data D?*

It can detect any single bit error in data D because the remainder R and the quotient will change from the expected answer.

1. *Can the above G detect any odd number of bit errors? Why?*

Yes, it will detect both odd and even number of bit errors because the receiver can detect error in data D because the remainder R and the quotient will change from the expected answer.