# EE5132 – Wireless and Sensor Networks
Part 1: Tutorial 4 – Questions

1. Nodes A, B and C operate in a CSMA/CA wireless network in which nodes B and C intend to send data packets to node A. The durations of the propagation delay is α, DIFS is 3α, SIFS is 2α, ACK is 5α, and the data packet is 10α. Assume that the medium is busy at node A initially. During this period, a packet (to be sent to node A) arrives at node B which selects a backoff counter of 5, while a packet (to be sent to node A) arrives at node C which selects a backoff counter of 3. Draw a timing diagram to illustrate the data transmissions among the three nodes. How long does it take to complete the transmissions and acknowledgements of the two data packets from nodes B and C to node A.

2. Figure Q.2 shows a network topology where the link metric is the probability of successful packet delivery. Node 1 has packets to send to Node 7. Determine the best route to take and explain your answer.

   Figure Q.2
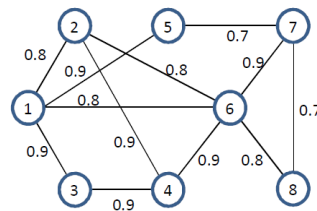
3. What are the inherent characteristics of wireless networks that require changes in existing TCP?

4. (a) What are the disadvantages of using wireline TCP over wireless networks?
   (b) Describe how indirect TCP deals with error-prone wireless channels.