4   Computer Networking (EK)

(a) Describe two drawbacks of layering. Provide an example for each.   [4 marks]

(b) (i) Explain the single-bit parity error-detection code using a single byte of data. How many bit errors can this code detect?

(ii) Based on the single-bit parity error-detection code devise a new code to detect and correct a single 1-bit error in 4 bytes of data. How many parity bits do you require? You may assume that parity bits are error-free.

[8 marks]

(c) Consider a wireless network. For each of the following cases, state whether the packet transmission would be successful; assume no collision avoidance. Explain your answers.

(i) Nodes A and B are in range of each other; no other node is within range. Node A sends a packet to B.

(ii) Nodes A and B are in range of each other; nodes B and C are in range of each other; A and C are not in range of each other. Both A and C send a packet to B simultaneously.

(iii) Nodes A and B are in range of each other; nodes B and C are in range of each other; A and C are not in range of each other. C is transmitting and A wants to send a packet to B.

(iv) Nodes A and B are in range of each other; nodes B and C are in range of each other; A and C are not in range of each other. A is transmitting and B wants to send a packet to C.

[8 marks]