Mid Term Summer 2020
Computer Communication & Networks

Note:

Q1.   **Briefly describe**
- **(a)**   Briefly describe the layers in the Internet model are the network support layers?
- **(b)**   Describe three types of transmission impairment.
- **(c)**   What does the Shannon capacity have to do with communications?
- **(d)**   Compare and contrast flow control and error control.
- **(e)**   Explain piggybacking and its usefulness. In white layer of OSI is it used and why?
- **(f)**   Brief HDLC w.r.t station types, transfer modes, frame types supported and flag field purpose?
- **(g)**   Brief the protocols for noiseless channels?
- **(h)**   What is differential encoding? Also explain the difference between NRZ-L and NRZI. And name the coding schemes of multilevel binary & bi-phase.

Q2.   **(i)**   Suppose a computer sends a packet at the network layer to another computer somewhere in the Internet. The logical destination address of the packet is corrupted. What happens to the packet? How can the source computer be informed of the situation?

(j)   A device is sending out data at the rate of 1 Mbps. How long does it take to send out a single character (8 bits)?

(k)   We have a channel with 4 KHz bandwidth. If we want to send data at 100 Kbps. What is the minimum SNR_{dB}? What is SNR?

Q3.   **(l)**   The waveform here belongs to a Manchester encoded binary data stream. Determine the beginning and end of bit periods (i.e., extract clock information) and give the data sequence.

(m)   Assume that the primary HDLC station in NRM has sent six I-frames to a secondary. The primary's N(S) count was three (011 binary) prior to sending the six frames. If the poll bit is on in the sixth frame, what will be the N(R) count back from the secondary after the last frame? Assume error-free operation.