

Dept. of Computer and Communication Engineering

Patuakhali Science and Technology University

3<sup>rd</sup> Semester (Level-2, Semester-II), Midterm Examination of B.Sc. Engg. (CSE), January-June: 2022

Course Code: CCE 211 Course Title: Data communication Engineering

Credit Hour: 3.0 Full Marks: 15 Duration: 60 Minutes

- 3      a) Define Data communication. "The three criteria necessary for an effective and efficient data communication network" justify the statement.

2      b) For  $n$  devices in a network. write the number of cable links required for a mesh, ring, bus, and star topology with each topology?

3      c) Write TCP/IP layers with duties, address and types of data delivery of each layer.

2      a) What is the relationship between the bandwidth of a signal before and after it has been encoded using spread spectrum?

2      b) Define the digital hierarchy used by telephone companies and list different levels of the hierarchy.

3      c) Four data channels (digital), each transmitting at 1 Mbps, use a satellite channel of 1 MHz. Design an appropriate configuration, using FDM.

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- 1 a) "The effectiveness of a data communications system depends on four fundamental characteristics" justify 3  
your answer.
- b) Assume a system uses five protocol layers. If the application program creates a message of 100 bytes and each layer (including the fifth and the first) adds a header of 10 bytes to the data unit, what is the efficiency (the ratio of application layer bytes to the number of bytes transmitted) of the system?
- c) A host communicates with another host using the TCP/IP protocol suite. What is the unit of data sent or received and responsibilities at each of the following layers? a. application layer b. network layer c. data-link layer d. Transport layer and e. Physical Link layer
- 2 a) What is direct sequence spread spectrum? What is the relationship between the bit rate of a signal before and after it has been encoded using DSSS? 2
- b) How does FDM System work? Explain with example. 3
- c) A multiplexer combines four 100-kbps channels using a time slot of 2 bits. Show the output with four arbitrary inputs. What is the frame rate? What is the frame duration? What is the bit rate? What is the bit duration? 2

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