**BRAC UNIVERSITY**

**Department of Computer Science and Engineering**

| Examination: Semester Final  Duration: 1 Hour 45 min | Semester: Summer 2022  Full Marks: 40 |
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CSE 320: Data Communications

Answer the following questions.

Figures in the right margin indicate marks.

**SET A**

| Name: | ID: | Section: |
| --- | --- | --- |

| **1. CO2** | a) | **Show** the staircase in the following graph and generate the digital data from the given analog signal using the Delta Modulation (DM) technique.  Answer this question in the question paper itself. You don’t have to answer this question in the answer script.     | 0 | | --- | | 6 |
| --- | --- | --- | --- | --- |
| **C04** | b) | **Differentiate** between the Unguided Propagation Modes. | 4 |
| **2. CO3** | a) | **Consider** there are six channels, two with a bit rate of 150 kbps and four with a bit rate of 75 kbps, are to be multiplexed using multi-level TDM with 3 synchronization bits. Write the following answers:  I. What is the size of a frame in bits?  II. What is the frame rate?  III. What is the duration of a frame?  IV. What is the data rate?  V. What is the output bit duration?  VI. How many input channels are there after doing multi-level TDM? | 6 |
| b) | Suppose you have five channels among which 4 channels have a bandwidth of 1500 kbps and one with 1250 kbps. How would you multiplex this? Drawand **validate** with visual representation. | 4 |
| **3. CO3** | a) | “In FHSS, if there are many k-bit patterns and the hopping period is short, a sender and receiver can have privacy”. **Justify.**  k-bit pattern   | 11 01 00 10 | | --- |  | **k-bit** | **Carrier Frequency** | | --- | --- | | 00 | 200kHz | | 01 | 300 kHz | | 10 | 400 kHz | | 11 | 500 kHz |   Draw FHSS cycle 3 times using the above pseudo random generated k-bit pattern and given frequency table. (\*\* Hint: Draw the Carrier frequency graph against hop period) | 6 |
| **CO5** | b) | In CSMAs /CD, what is the advantage of having collision detection and what does the node do when it detects collision? **Discuss** in brief. | 4 |
| **4. CO5** | a) | Assume a packet is made only of four 16-bit words (A7A2)16, (CABF)16, (903A)16, and (A123)16. **Show** the checksum at the sender.  If the second data item is changed to (AB3D)16 and the third data item is changed to (04BD)16 during transmission, check if there is any error at the receiver site.  (Hint: The given words are in hexa-decimal value, that means, each digit can be represented by 4 bits. Remember hexadecimal values range from 0000 – FFFF). | 6 |
|  | b) | What is polling? How is Token passing better than CSMA/CD, state three points? | 4 |

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