**Assignment - 3**

**Semester: Spring 2023**

**Submission: 11/12April, 2023 (in Class)**

**Total Marks: 20**

**Total Questions: 5**

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| 1. | a. **Explain** how FHSS achieves bandwidth spreading and privacy in brief.  b. **Explain** how DSSS achieves bandwidth spreading and privacy in brief.[2+2] |
| 2. | Suppose, you are given with the k-bit pattern and Carrier Frequency as follows:  **k-bit pattern**   |  | | --- | | 10 11 01 00 |  |  |  | | --- | --- | | **k-bit** | **Carrier Frequency** | | 00 | 250kHz | | 01 | 150 kHz | | 10 | 350 kHz | | 11 | 450 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) [5] |
| 3. | Distinguish between the two basic multiplexing techniques (FDM and TDM) using appropriate diagrams.[5] |
| 4. | Suppose, you have 9 channels, each of 64 MBps. You have to use synchronous TDM to multiplex these channels. If each channel passes 3 characters during each input slot, answer the following: [6]   1. What is the size of an output frame in bits? 2. What is the input bit duration? 3. What is the output slot duration? 4. What is the output bit duration? 5. What is the output frame rate? 6. What is the output data rate? |
| 5. | Sketch the spread signal from the above original signal and the given spread code. [5] |
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