SRM Institute of Science and Technology  College of Engineering and Technology

DEPARTMENT OF ECE

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

**Academic Year: 2024-2025 (Even)**

**21ECC302T Analog and Digital Communication**

**Assignment Questions**

**Year & Sem: III & VI Max. Marks: 30**

**Course Articulation Matrix :**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **21ECC302T/ Analog and Digital Communication** | **PROGRAM OUTCOME (PO)** | | | | | | | | | | | | **PROGRAM SPECIFIC OUTCOMES** | | |
| **S.NO** | **COURSE OUTCOME** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **1** | **2** | **3** |
| 1 | Explain the Various Analog Modulation Techniques | 3 | - | - | - | - | - | - | - | - | - | - | 2 | 2 | - | - |
| 2 | Analyze the Noise performance of Radio transmitters and Receivers | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 | - | 3 | - |
| 3 | Demonstrate the modulation and | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | 3 |
| 4 | detection of Received Digital Signal | 3 | - | - | - | 3 | - | - | - | - | - | - | - | - | - | 2 |
| 5 | Apply the suitable passband Techniques for real time application | 3 | - | 3 | - | - | - | - | - | - | - | - | - | 3 | - | - |

|  |  |  |  |  |  |
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| **Q. No** | **Questions** | **Marks** | **BL** | **CO** | **PO** |
| **1.** | A continuous signal is bandlimited to 5 kHz. The signal is quantized into 8 levels of a PCM system with the probabilities 0.25, 0.2, 0.2, 0.1, 0.1, 0.05, 0.05, and 0.05. Calculate the entropy and the rate of information. | **5** | **2** | 5 | **3** |
| **2.** | Consider a source that emits five different symbols {A, B, C, D, E} with the following probabilities {0.4, 0.15, 0.15, 0.15, 0.15}  Perform Shannon-Fano coding for these symbols and determine:   1. The Shannon-Fano code for each symbol. 2. The average code length. 3. The efficiency of the code. | **10** | **3** | 5 | **3** |
| **3.** | An event has six possible outcomes with the probabilities:  p₁ = 1/2, p₂ = 1/4, p₃ = 1/8, p₄ = 1/16, p₅ = 1/32, p₆ = 1/32  Find the entropy of the system. Also, find the rate of information if there are 16 outcomes per second. | **5** | **2** | 5 | **3** |
| **4.** | A source emits five different symbols {A, B, C, D, E} with the following probabilities{0.30, 0.25, 0.20, 0.15, 0.10} Perform Huffman coding for these symbols and determine:   1. The Huffman code for each symbol. 2. The average code length. 3. The efficiency of the code. | **10** | **3** | 5 | **3** |