Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **18EC3016** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MODERN DIGITAL COMMUNICATION TECHNIQUES** | **Max. marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Construct and analyse a receiver that receives equal energy, equiprobable binary waveform using minimum distance decoding principle. | CO1 | 8 |
| b. | Compare the performance of Rayleigh and Rician channels in random phase and amplitudes. | CO1 | 8 |
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| 2. | a. | Design zero forcing linear equalizer. | CO2 | 8 |
| b. | Derive Nyquist criterion for zero ISI. | CO2 | 8 |
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| 3. | a. | Compare IQ modulation and continuous modulation. | CO3 | 8 |
| b. | Describe the features of CPFSK and CPFM. | CO3 | 8 |
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| 4. | a. | Illustrate the functional architecture of block coded communication systems. | CO4 | 8 |
| b. | Compare error probability performance of linear block codes. | CO4 | 8 |
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| 5. | a. | Demonstrate the distance properties of convolution codes | CO5 | 8 |
| b. | Illustrate state, Tree, trellis diagrams with examples. | CO5 | 8 |
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| 6. | a. | How matched filter maximizes the SNR? | CO3 | 5 |
| b. | State Channel capacity theorem. Explain how channel capacity is for a finite-bandwidth continuous-time channel subject to Gaussian noise. | CO4 | 5 |
| c. | Turbo codes ishigh-performance forward error correction codes –justify. | CO5 | 6 |
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| 7. | a. | Describe eye pattern for a performance analysis. | CO2 | 5 |
| b. | By suitable examples discuss OFDM applications. | CO3 | 5 |
| c. | State Shannon coding theorem and discuss about its implications. | CO4 | 6 |
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| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Explain the principle that supports the antijam capacity of spread spectrum signal. | CO6 | 6 |
| b. | Explain the PN sequence randomness properties with suitable examples. | CO6 | 6 |
| c. | A slow frequency hopped MFSK system operates with 4 bits per MFSK symbol and 5 MFSK symbols per hop. Determine processing gain of the system. | CO6 | 4 |
| d. | A hopping bandwidth of 400MHz and a frequency step size of 100 Hz are specified. What is the minimum number of PN chips that are required for each frequency word? | CO6 | 4 |