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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May – 2017**

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| **Code :** | **14EC2021** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DIGITAL COMMUNICATION** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | With a neat block diagrams enlighten pulse code modulation in detail. | CO1 | 15 |
| b. | Sketch the transmitter of adaptive delta modulation. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Elucidate the delta modulation and demodulation with a neat block diagram. | CO1 | 15 |
| b. | Discuss the types of quantization errors. | CO1 | 5 |
| 3. | a. | Explicate the basis operation of matched filter receiver with suitable diagrams. Derive the condition for which the output SNR is maximized. | CO1 | 15 |
|  | b. | Give details about eye pattern. | CO1 | 5 |
| (OR) | | | | |
| 4. |  | State your perception about ISI? State the causes of ISI. With suitable block diagram and wave forms obtain the Nyquist’s criterion for distortionless baseband binary transmission and ideal solution. | CO1 | 20 |
| 5. | a. | With a neat block diagram and signal space diagram explain the principle and operation of QPSK transmitter and receiver. | CO2 | 15 |
|  | b. | Sketch DPSK transmitter. | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | Draw the block diagram for the generation and detection of BFSK signal. | CO2 | 15 |
|  | b. | Discuss about M ary FSK. | CO2 | 5 |
| 7. |  | A discrete memoryless source has an alphabet of five symbols with their probabilities for its output as given here:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Symbol | s0 | s1 | s2 | s3 | s4 | | Probability | 0.4 | 0.2 | 0.2 | 0.1 | 0.1 |   Compute two different Huffman codes for this source. Hence, for each of the two codes, find  (a) The average code-word length.  (b) The variance of the average code-word length over the ensemble of source symbols. | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Consider the four codes listed below: symbol: s0,s1,s2,s3,s4  Code I: 0, 10,110,1110,1111. Code II: 0,01,001,0010,0011. Code III: 0,01,011,110,111. Code IV: 00,01,10,110,111. Two of these four codes are prefix codes. Identify them and construct their individual decision trees. | CO3 | 5 |
|  | b. | Consider a (6,3) linear block code whose generator matrix is 1 0 0 :1 1 1  G = 0 1 0 :1 1 0  0 0 1 :1 0 1  (i) Find all the code vectors and hamming weights.  (ii) Determine the error correcting and detecting capability.  (iii) Find the parity check matrix H.  (iv) Construct the decoding table. | CO3 | 15 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Give details about the direct sequence spread spectrum with neat sketches. | CO3 | 15 |
|  | b. | List the applications of spread spectrum. | CO3 | 5 |

ALL THE BEST