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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**Supplementary Examination – June – 2017**

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| **Code :** | **14EC2014** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DIGITAL SIGNAL PROCESSING** | **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. | Compute 8 point DFT of a sequence using radix-2 DIT-FFT algorithm. | CO1 | 16 |
| b. | **CompareDIF-FFT and DIT-FFT algorithms.** | CO1 | 4 |
| (OR) | | | | |
| 2. | a. | Findfor the input sequence and impulse response using overlap save method. | CO1 | 16 |
| b. | Compare linear and circular convolutions. | CO1 | 4 |
| 3. | a. | Determine the DFT of the sequence | CO1 | 4 |
|  | b. | Compute 8 point DFT of a sequence using radix-2 DIT-FFT algorithm. | CO1 | 16 |
| (OR) | | | | |
| 4. | a. | Find the response of an LTI system with impulse response  h(n)={-4,-4,-6} for input  x(n)={1, 2,3,4,5} using circular convolution | CO1 | 10 |
|  | b. | Find the circular convolution of x(n)={1,2,3,4} with h(n)={1,1,2,2} | CO1 | 10 |
| 5. | a. | Design a digital Butterworth filter that satisfies the following constraints using bilinear transformation. Assume T=1 s. | CO2 | 16 |
|  | b. | Using impulse invariance methodconvert the followinganalog transfer function into digital with sampling period T= 0.2 second. | CO2 | 04 |
| (OR) | | | | |
| 6. |  | Design a Chebyshev filter for the following specifications using impulse invariance method. | CO2 | 20 |
| 7. |  | Design a linear phase FIR digital filter for the given specifications using Hamming window of length M=7. | CO2 | 20 |
| (OR) | | | | |
| 8. |  | Design and implement a linear phase FIR filter of length N=15 which has the following unit sample sequence .    by frequency sampling method. | CO2 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the basic LMS algorithm and discuss its practical limitations | CO3 | 10 |
|  | b. | An LTI system is characterized by the difference equation y[n] = 0.75 y[n-1]+0.3x[n]. The input signal x[n] has a range of -4V to +4V represented by 9 bits. Calculate the output noise power due to input quantization | CO3 | 10 |

ALL THE BEST