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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12EC216** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **DIGITAL SIGNAL PROCESSING** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Marks** | |
| **PART-A(10X1=10 MARKS)** | | | | |
| 1. | What is zero padding? | | (1) | |
| 2. | Compute the DFT of an impulse signal shifted by no. | | (1) | |
| 3. | Give the equation which relates the analog and digital frequencies. | | (1) | |
| 4. | IIR filters are recursive. True/False. | | (1) | |
| 5. | What are the advantages of FIR filter? | | (1) | |
| 6. | State the condition for a digital filter to be stable. | | (1) | |
| 7. | What are the different quantization methods? | | (1) | |
| 8. | Determine dead band of the filter. | | (1) | |
| 9. | Give some examples for fixed point DSPs. | | (1) | |
| 10. | What are the different stages in pipelining? | | (1) | |
| **PART B(5 X 3= 15 MARKS)** | | | | |
| 11. | Calculate the number of multiplications needed in the calculation of DFT and FFT with 64-point sequence. | | (3) | |
| 12. | Write a short note on prewarping. | | (3) | |
| 13. | What are Gibbs oscillations? | | (3) | |
| 14. | Draw the quantization noise model for a I order system. | | (3) | |
| 15. | What are the factors that influence selection of DSPs? | | (3) | |
| **PART C(5 X 15= 75 MARKS)** | | | | |
| 16. |  | Compute the DFT for the sequence  by using radix-2 DIT FFT. | | (15) | |
| (OR) | | | | |
| 17. |  | Perform the circular convolution of the following sequences using DFT and IDFT method. *x(n)* = {1,1,2,1}; *h(n)* = {1,2,3,4} | | (15) | |
| 18. |  | Design a Chebyshev filter for the following specification using bilinear transformation.  Assume T = 1 sec. | | (15) | |
| (OR) | | | | |
| 19. |  | Obtain the direct form I, direct form II and Cascade realization of the LTI system governed by the equation | | (15) | |
| 20. |  | Design an ideal high pass filter with the following frequency response using a  Hanning window. Find the values of for N=11. Find. Plot the magnitude response. | | (15) | |
| (OR) | | | | | |
| 21. |  | Determine the filter coefficients obtained by sampling for N = 7. Find. | | (15) | |
| 22. | a. | Explain product quantization error with an example. | | (10) | |
| b. | Discuss the effect on quantization on pole locations for a given system function. | | (5) | |
| (OR) | | | | | |
| 23. |  | Explain zero input limit cycle oscillations and derive the equation for dead band. | | (15) | |
| 24. | a. | Explain the basic Wiener filter theory in detail. | | (7) | |
| b. | Explain the process of pipelining in detail. | | (8) | |
| (OR) | | | | | |
| 25. |  | Draw and explain the architecture of TMS320C5416. | | (15) | |

ALL THE BEST