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

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| **Code :** | **11EI202/12EI224** | **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 energy signal? | 1 |
| 2. | What are even signals? Give example. | 1 |
| 3. | Define Discrete forurier transforms for a sequence x(n). | 1 |
| 4. | State shifting property of Discrete forurier transforms. | 1 |
| 5. | What is bilinear transformation? | 1 |
| 6. | What is meant by frequency wrapping? | 1 |
| 7. | What is FIR system? | 1 |
| 8. | What are the effects of windowing? | 1 |
| 9. | Give the significance of Multiplier-Accumulator unit in DSP | 1 |
| 10. | Define pipelining. | 1 |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11. | Mention the advantages of digital signal processing over analog signal processing. | 3 |
| 12. | What is the need of FFT algorithm? Why it is called so? | 3 |
| 13. | What is an IIR filter? Compare its characteristics with an FIR filter. | 3 |
| 14. | What is a Hamming window function? Obtain its frequency domain characteristics. | 3 |
| 15. | Distinguish between programmable DSP and general purpose processor. | 3 |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. |  | Compute linear and circular periodic convolutions of two sequences  x1(n) ={1,1,2,2} and x2(n) = {1,2,3,4} | 15 |
| (OR) | | | |
| 17. |  | With illustration, Explain folding and time scaling operations on discrete time signals | 15 |
| 18. |  | Given x(n) ={1,2,3,4,4,3,2,1} find X(k) using DIT FFT algorithm. | 15 |
| (OR) | | | |
| 19. |  | Given x(n) = 2n and N=8 find X(k) using DIF FFT algorithm. | 15 |
| 20. |  | Design a digital Butterworth filter satisfying the following constraints using bilinear transformation. Assume T=1s.  0.9≤ |Hejω)| ≤ 1 , 0≤ω≤  |Hejω)| ≤ 0.2,≤ω≤ | 15 |
| (OR) | | | |
| 21. |  | Determine the direct forms I and II realizations for a third-order IIR transfer function  H(z) = | 15 |
| 22. |  | A low-pass filter is to be designed with the following desired frequency response.  Hd(ejω) = e-2jω, ≤ω≤  0, ≤|ω|≤  Determine the filter coefficients hd(n) if the window function is defined as  ω(n) = 1, 0≤n ≤4  0, otherwise | 15 |
| (OR) | | | |
| 23. |  | Discuss in detail direct form and cascade form realisation of FIR systems. | 15 |
| 24. |  | Explain TMS320C5XDSP architecture with necessary On-chip peripherals. | 15 |
| (OR) | | | |
| 25. |  | Briefly explain architecture of Very-Long Instruction Word (VLIW). | 15 |