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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18EC2005 (FOR MEDIA STUDENTS ONLY)** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SIGNALS AND SYSTEMS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (10X1 = 10 MARKS)** | | | |
| 1. | Write an example for deterministic signal. | CO1 | 1 |
| 2. | Illustrate discrete time ramp signal. | CO1 | 1 |
| 3. | Define Impulse response. | CO2 | 1 |
| 4. | Determine whether the signal is causal or non-causal: x(t) = 2cost | CO2 | 1 |
| 5. | State Parseval’s theorem. | CO3 | 1 |
| 6. | Show the relation between H(jω) and Y(jω). | CO3 | 1 |
| 7. | State the relationship between Fourier Transform and Laplace Transform. | CO4 | 1 |
| 8. | Mention the effect of undersampling. | CO4 | 1 |
| 9. | Find the discrete time fourier transform of {1, 2, 2}. | CO5 | 1 |
| 10. | Sketch the sequence . | CO1 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | |
| 11. | Examine whether the given signal is periodic or not. If periodic, find the fundamental period: x(t)=2\*cos(3πt) + 7\*cos(9t) | CO1 | 3 |
| 12. | Show commutative and distributive properties in convolution integral. | CO2 | 3 |
| 13. | Find the continuous time fourier transform for the signal: x(t) = e-at u(t). | CO3 | 3 |
| 14. | State Sampling Theorem. | CO4 | 3 |
| 15. | Define discrete time fourier series. | CO5 | 3 |
| 16. | Compare recursive with non-recursive system. | CO6 | 3 |

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|  | **PART – C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | | |
| 17. |  | Define signal. With suitable examples, explain the classification of signals based on their characteristics. | CO1 | | 12 |
| 18. |  | Using graphical procedure convolve the following two sequences linearly x(n) and h(n) to get y(n). Given x(n) = {1, -1, 1, -1} and h(n) = {2, -2}. | CO2 | | 12 |
| 19. |  | A square wave is shown in fig: 1. Obtain trigonometric Fourier series for the given waveform.(Assume T0=2)    **Fig:1** | CO3 | | 12 |
| 20. |  | Consider the system ‘S’ characterized by the differential equation.  (i) Find the system function and impulse response of the system using  Laplace transform.  (ii) Find the output y(t) for x(t)=e-4t u(t). | CO4 | | 12 |
| 21. | a. | Find the inverse discrete timefourier transform of the following  (i) X(ejω) =1+ 2e-jω -3e-2jω + 2e-3jω + 4e-4jω  (ii) | CO5 | | 6 |
| b. | State and explain the following properties of Discrete Time Fourier Transform. a) Time Reversal b) Time Shifting. | CO5 | | 6 |
| 22. |  | Brief different types of sampling methods. Explain impulse train sampling with neat diagrams. | CO4 | | 12 |
| 23. |  | Fig:2 shows a continuous time signal. Determine  (i) x(t-3) (ii) x(3t) (iii) x(-t+2) (iv) x(t)δ(t) (v) x(2t+1)    **Fig:2** | CO1 | | 12 |
|  |  | **Compulsory:** | | | |
| 24. | a. | Find the Z-transform for the following signals and depict the ROC. | | CO6 | 4 |
| b. | Construct direct form-II realization of a discrete time system described by the difference equation:    Question No.24 from Module 6 | | CO6 | 8 |