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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| **Sub. Code:** | **14EC2003** | **Duration :** | **3hrs** |
| **Sub. Name:** | **SIGNALS AND SYSTEMS** | **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. | Find (a) x(-2t-1) (b) x(2(t-1)) (c) x(t).u(t-2) from the following figure. | CO1 | 14 |
| b. | Determine whether the following systems are static or dynamic:  i. y(t)=x(t-2) ii) y(t) =x2(t) | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | Checkwhether the given system is causal, time invariant and linear.  y(n) = x(n) + x2(n-1). | CO1 | 15 |
| b. | Check whether the given signal x(t)=cos(π/3t) + sin(π/4t) is periodic or not, if it is periodic, find its fundamental period | CO1 | 5 |
| 3. |  | The input and output of a causal LTI system are represented by the differential equation  . Assume initial conditions are zero.  Find the following by using Fourier transform  (i) Impulse response of the system (ii) frequency response of the system | CO2 | 20 |
| (OR) | | | | |
| 4. | a. | Write any four Properties of Continuous Time Fourier Transform | CO2 | 4 |
|  | b | Find the Fourier Transform of the following   1. e(-3t)[u(t+2)-u(t-3)] (ii) δ(t-0.5)+ δ(t-1) | CO2 | 16 |
| 5. |  | Using Laplace transform, find the transfer function and Impulse response for a given differential equation. | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | By using partial fraction method, find the Inverse Laplace Transform of | CO2 | 10 |
|  | b. | Find the Laplace transform and ROC of e(-5t)[u(t)-u(t-5)] | CO2 | 10 |

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| 7. | a. | Find the DTFT of the following :   1. {1,-1, 2, 2 } (ii) (0.5)n u(n)+2-n u(-n-1) | CO3 | 10 |
|  | b. | Find the Convolution of the signals given below using DTFT  x1(n)=(0.2)n u(n) x2(n)=(0.33)n u(n) | CO3 | 10 |
| (OR) | | | | |
| 8. |  | Using DTFT, find the Frequency response and Impulse response for a given difference equation.  y(n)+ 0.166 y(n-1)- 0.166 y(n-2)=x(n) | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Find the Z-transform and ROC of the following:   1. {1,2,-1,3,2,1} (ii) (2/3)n u(n)+(-0.5)n u(n) | CO3 | 12 |
|  | b. | Determine the Inversre Z-transform of  ; ROC |z|>3 | CO3 | 8 |

**ALL THE BEST**