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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 :** | **12EC214** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **SIGNALS AND SYSTEMS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Marks** |
| **PART-A(10X1=10 MARKS)** | | | |
| 1. | Define a discrete time signal. | | (1) |
| 2. | Static system is also called as memory system. True/False | | (1) |
| 3. | Continuous time fouriertransform of δ(t) is \_\_\_\_\_\_\_\_\_\_\_\_\_. | | (1) |
| 4. | Define inverse continuous time fourier transform (CTFT). | | (1) |
| 5. | A signal having a spectrum ranging from 1KHz to 10KHz. Find the Nyquist rate. | | (1) |
| 6. | What is sampling? | | (1) |
| 7. | Discrete time fourier transform of {1, 2,-1, 2} is \_\_\_\_\_\_\_\_\_\_\_\_\_. | | (1) |
| 8. | Write the Z-transform of x(n). | | (1) |
| 9. | What is a non-recursive system? | | (1) |
| 10. | Define impulse response. | | (1) |
| **PART B(5 X 3= 15 MARKS)** | | | |
| 11. | Check whether the system y(t)=t2x(t) is linear or not. | | (3) |
| 12. | List any three properties of region of convergence(ROC). | | (3) |
| 13. | Mention different types of sampling methods. | | (3) |
| 14. | A causal LTI system is described by the difference equation y(n)-ay(n-1)=bx(n)+x(n-1). Find the frequency response of the system. | | (3) |
| 15. | Represent the sequence x(n)= {1, 2, 3, 4} as sum of shifted unit impulses. | | (3) |
| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. |  | With example, explain the different classification of signals and systems. | (15) |
| (OR) | | | |
| 17. | a. | Find the output of a system with impulse response h(t) = e-3tu(t) and the input signal  x(t)=u(t-3) - u(t-5) | (9) |
| b. | A discrete time signal x(n) is shown in figure, Sketch i) x(n–1) ii) x(–n+2) iii) x(-n-1)  D:\shine\acadamics\signala and systems\exam\ch14.png | (6) |
| 18. |  | State and prove any five properties of continuous time fourier transform. | (15) |
| (OR) | | | |
| 19. |  | Find the inverse laplace transform for the given system function | (15) |
| 20. |  | Define Sampling theorem. Explain impulse train sampling and reconstruction of continuous time signal from its samples. | (15) |
| (OR) | | | |
| 21. |  | The signal x(t)= 2+cos(100πt) is sampled at a rate 80 samples per second. Plot the sampled signal spectrum |ω|≤260π. Can the original signal be recovered from samples? Explain. | (15) |
| 22. |  | Find the DTFT of the following signals.  (a) x(n)=  (b) x(n)=u(n)  (c) x(n)=δ(n-k) (d) x(n)=a**|n|** | (15) |
| (OR) | | | |
| 23. |  | Find the inverse Z-transform of ROC:|z|>2 | (15) |
| 24. | a. | Plot the pole-zero pattern for the given system    Check whether the system is stable or not. | (5) |
| b. | Find the impulse response and step response for the system | (10) |
| (OR) | | | |
| 25. |  | Obtain the cascade form and parallel form realization of the system described by the difference equation | (15) |

ALL THE BEST