**18EC404**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **August, 2021** | **Electronics and Communication Engineering** | | |
| **Fourth Semester** | **Signals & systems** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | Define unit step function | CO1 | |  |
|  | b) | Define Causal signal. | CO1 | |  |
|  | c) | What is a energy signal? | CO1 | |  |
|  | d) | State the condition for an LTI system to be stable. | CO2 | |  |
|  | e) | List the applications of Convolution. | CO2 | |  |
|  | f) | What is Fourier transform of u(t) | CO3 | |  |
|  | g) | What is pass band and stop band. | CO3 | |  |
|  | h) | What is filter? | CO3 | |  |
|  | i) | Define auto correlation | CO4 | |  |
|  | j) | State sampling theorem. | CO4 | |  |
| **Unit - I** | | | | | |
| 2. |  | Define system and classify with examples. | CO1 | **10M** | |
|  |  | **(OR)** |  |  | |
| 3. |  | Sketch the following signals i) u(t+2) ii) 5r(t+1) iii) 5Sgn (t-4). iv) u(-t+2) | CO1 | **10M** | |
| **Unit – II** | | | | | |
| 4. |  | Find the graphical convolution for x(t) = u(t+3) and h(t)= e-3t u(t). | CO2 | **10M** | |
|  |  | **(OR)** |  |  | |
| 5. |  | Find convolution for   1. x(t) = e-4t u(t) 2. h(t) = e-2t u(t) | CO2 | **10M** | |
| **Unit – III** | | | | | |
| 6. |  | State and prove convolution and frequency shifting properties of Fourier transform | CO3 | **10M** | |
|  |  | **(OR)** |  |  | |
| 7 | a. | Find Fourier transform of x(t) = Sgn(t). | CO3 | **5M** | |
|  | b. | State and prove time shifting property of Fourier transform |  | **5M** | |
| **Unit - IV** | | | | | |
| 8. | a) | Explain aliasing effect and how to remove that problem | CO4 | **5M** | |
|  | b) | Distinguish between convolution and correlation | CO4 | **5M** | |
|  |  | **(OR)** |  |  | |
| 9. | a) | What is the relation between auto correlation function and energy/power spectral density function? | CO4 | **5M** | |
|  | b) | Prove that Autocorrelation exhibits conjugate symmetry | CO4 | **5M** | |

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