**H.T No**

**Regulations:**

**A18**



**Sreenidhi Institute of Science and Technology**

(An Autonomous Institution)

**Code No: 7C303**   **Date: 23-July-2021(AN)**

**B.Tech II-Year I- Semester Covid-19 Special External Examination, July-2021 (Regular)**

**SIGNALS AND SYSTEMS (ECE and ECM)**

**Time: 3 Hours Max.Marks:70**

***Note: a****) No additional answer sheets will be provided.*

*b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.*

*c) Missing data can be assumed suitably.*

**ANSWER ANY 5 OUT OF 8 QUESTIONS. EACH QUESTION CARRIES 14 MARKS.**

**Bloom's Cognitive Levels of Learning (BCLL)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Remember | L1 | Apply | L3 | Evaluate | L5 |
| Understand | L2 | Analyze | L4 | Create | L6 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | **BCLL** | **CO(s)** | **Marks** |
| 1. | a) | Express the following signal f(t) in terms of sin(t) using approximation and evaluate mean square error.  f(t) = 1.5 for 0 ≤ t ≤ π  = -1.5 for π ≤ t ≤ 2π. | L4 | CO1 | [7M] |
|  | b) | Find the energy, power, even and odd components of the signal u(t). | L3 | CO1 | [7M] |
|  |  |  |  |  |  |
| 2. | a) | Determine the discrete Fourier series representation of the below sequences:   1. x(n)=n) ii. x(n)=n) | L5 | CO2 | [7M] |
|  | b) | State and prove any two properties of Fourier Transform. | L1 | CO2 | [7M] |
|  |  |  |  |  |  |
| 3. | a) | Check the system y(t) = t2u(t) for linearity, time invariance, stability and causality | L4 | CO3 | [7M] |
|  | b) | Write the classification of signals with example. | L1 | CO3 | [7M] |
|  |  |  |  |  |  |
| 4. | a) | Explain the relation between Convolution and Correlation. | L2 | CO4 | [7M] |
|  | b) | Find the inverse Laplace Transform of X(s):  X(s)= -3<Re(s)<-1 | L5 | CO4 | [7M] |
|  |  |  |  |  |  |
| 5. | a) | Prove sampling theorem for band limited signals. | L3 | CO5 | [7M] |
|  | b) | What is the need of sampling? List types of sampling techniques. | L2 | CO5 | [7M] |
|  |  |  |  |  |  |
| 6. | a) | State and prove time shifting and time convolution properties of z- transform | L1 | CO6 | [7M] |
|  | b) | Determine the response of the system: y(n).  to the input signal x(n) =δ(n)- δ(n-1) with help of Z-Transform. | L5 | CO6 | [7M] |
|  |  |  |  |  |  |
| 7. | a) | State and prove the Parseval’s relation for continuous time signals. | L1 | CO2 | [7M] |
|  | b) | Write the conditions for the existence of Fourier series. | L1 | CO3 | [7M] |
|  |  |  |  |  |  |
| 8. | a) | Find the Laplace Transform of the following.  i) t e-at u(t) ii) Cos ω0t u(t). | L5 | CO4 | [7M] |
|  | b) | State and prove initial and final value theorems of z-transform. | L1 | CO5 | [7M] |

**-- 00 -- 00 –**