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Reg. No: ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations November-2020
Signals and Systems
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 a Define various elementary signals in continuous time and discrete time and indicate them graphically. **7M**
b Write short notes on following signals **5M**
  i) Unit step   ii) Unit impulse   iii) Unit ramp iv) Signum

OR

2 a Check whether the following systems are causal or not? **6M**
  (i) $y(t)=x^2(t)+x(t-3)$ (ii) $y(t)=x(t+2)$ (iii) $y(t)=x(-2n)$
b State the properties of continuous time Fourier series? **6M**

UNIT-II

3 a Find the Fourier transform of the following signals **6M**
  i) impulse function   (ii) $x(t)=e^{-at}u(t)$ (iii) $x(t)=e^{-j\omega ot}$
b State and prove the time shifting and frequency shifting properties of Continuous time Fourier transform. **6M**

OR

4 a Write the Dirichlet's conditions. **5M**
b State and prove the convolution and multiplication properties of Discrete time Fourier transform. **7M**

UNIT-III

5 a Derive the transfer function and impulse response of an LTI system. **6M**
b Obtain the conditions for distortion less transmission through a system. **6M**

OR

6 a Discuss the properties of linear time invariant systems. **6M**
b Let the system function of an LTI system be $1/(j\omega+2)$.what is the output of the system for an input $(0.8)^t u(t)$? **6M**

UNIT-IV

7 a State and prove the Parseval's theorem for energy signal. **8M**
b Write the properties of convolution. **4M**

OR

8 a Explain the detection of periodic signals in the presence of noise by cross correlation **6M**
b Write the properties of ESD and PSD. **6M**

UNIT-V

9 a Prove that the final value of x(n) for $X(z) = z^2/(z-1)(z-0.2)$ is 1.25 and its final value is unity? **6M**
b Find the Z-transform of X(z) given by $X(z) = 1/(1-az^{-1})$, ROC; $z|>|a|$. **6M**

OR

10 a Find the Laplace transform of signal $x(t)= e^{-at}u(t) -e^{-bt}u(-t)$ and also find its ROC. **6M**
b Find the inverse Laplace transform of: **6M**
  $X(s) = 1/ s(s+1) (s+2) (s+3)$.

*** END ***