Exam.Code:0927
Sub. Code: 6572

2063

B.E. (Electronics and Communication Engineering)
Third Semester
EC-302: Signals and Systems

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section. Use of scientific calculator is allowed.*

x-x-x

Q.1 Attempt all questions:-
(a) Define Gibbs Phenomenon. **(2)**
(b) Define continuous time unit step and unit impulse. **(2)**
(c) Define Energy and power signal. **(2)**
(d) What is the Aperture effect? **(2)**
(e) State Time Shifting property in relation to Fourier series. **(2)**

Section- A

Q. 2(a) The average power of the following signal is: - **(5)**

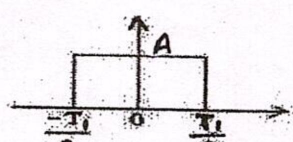

Fig.1

(b) For signal X(t)=2u(t+1)-2u(t-3) plot the following: **(5)**
i) X(t+4) ii) X(t-3)

Q.3 (a) Consider the system: Y(t)=x(t) sin[w_0t]. Determine whether system is: **(5)**
(i) Linear (ii) Stable (iii) Causal (iv) Time Invariant (v) Memoryless
(b) Compute the convolution X_1(t)= cost u(t) and X_2(t)= u(t). **(5)**

Q.4 (a) Find the Fourier transform of Unit step signal. **(5)**
(b) Explain Reconstruction of signals from its samples with neat diagrams. **(5)**

Section-B

Q.5 Using Laplace transform, find the forced response and the natural response of the system described by $\frac{d^2y(t)}{dt^2}+5\frac{dy(t)}{dt}+6y(t)=\frac{dx(t)}{dt}+6x(t)$. The initial conditions for the system are $y(0-)=1$ and $\left.\frac{dy(t)}{dt}\right|_{t=0-}=2$. Determine the two responses for a step input. **(10)**

Q.6 (a) Explain Region of convergence in Z-Transform. **(5)**
(b) Calculate Z-Transform of the X(n)= n^2 u(n) . **(5)**

Q.7 (a) Explain State transition matrix and its importance. **(5)**
(b) Find initial and final vales of X(s) = (s+4)/(s^2+3s+5). **(5)**

x-x-x