Department of electronics and telecommunication

Subject: Signals and Systems Set-B CT-2 Time:1Hr 15M

QA Solve any three from following questions.(Bold no. in bracket indicates position of n=0th sample)

Q1) Prove the following properties of Fourier transform

(i)Linearity (ii)Frequency shifting (iii)Time shifting (iv) Time reversal

Q2)If the i/p sequence x(n) =**1/3 ; for -1≤ n ≤1**

= 0 otherwise is applied to a system whose unit sample response is h(n) =a^n u(n) compute magnitude and phase spectrum of output.

Q3)Find DFT of x(n) = {1,1,1,1} by matrix method. Also draw its magnitude and phase spectrum.

Q4)If x(n)={....0,**1**,-1,0.....} find Fourier transform and sketch its magnitude and phase spectrum.

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QA Solve the following questions. (Any Three)

1) If F.T.[x(t)] = X(jW) then, Prove (i) Differentiation in time frequency (ii) Differentiation in frequency (iii) Time-integration (iv) convolution(v) Time Scaling .

2)Find the Fourier transform of the following and sketch magnitude and phase spectrum.

i)$x(t)= \delta(t)$ ii) $x(t) = e^{-at}\ u(t)$ iii)$x(t) = \cos \omega_0 t$

3) If F.T.[x(n)] = X(W) then, Prove that (i)F.T.[$\cos W_o n \cdot x(n)$] = $\frac{1}{2}[X(W-W_o) + X(W+W_o)]$.

(ii) F.T.[x(n-k)]= e^{-jwk} X(W)

4) If x(n)={1,1,01} find 4-point DFT by matrix method.