Q.P. Code :24725

[Time: 03 Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Q.1 is compulsory.
2. Attempt any three questions from remaining questions
3. Assume suitable data wherever required.

Q.1 a) If x[n] = {3, 2, 4} h[n] = {1, 2, 3} Find y[n] using circular convolution. **05**

b) Prove any two properties of Fourier Transform **05**

c) Find the Z transform of the given function $x(n) = (1/4)^n + u(n) + (1/5)^n u(-n-1)$ **05**

d) Check the linearity and Time variance property of the system $y[n] = x[n^2]$ **05**

Q.2 a) Find the even and odd components of x[n] = {-1, 7,-2, 3,-7, 6} **05**

b) Find the initial value and final value of **05**

$$X(z)=\frac{2z^{-1}}{1-1.8z^{-1}\ 0.08z^{-2}}$$

c) An LTI system is described by the difference equation **10**
$2y(n) + 3y(n-1) + y(n-2) = u(n) + u(n-1) - u(n-2)$
Find the response of the system when initial conditions are given
$y(-1) = 2$, $y(-2) = -1$ and unit step is applied at the input.

Q.3 a) Explain all basic filters and plot their magnitude responses |H(w)| **10**

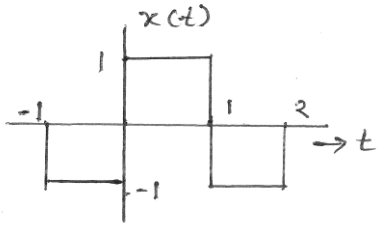
b) Identify the type of filter based on its pass band by analytical method. Draw pole-zero plot. **10**

$$H(Z)=\frac{1}{1+0.8z^{-1}}$$

Q.4 a) $$H(Z) = \frac{(1-0.5Z^{-1})(1-Z^{-1})}{(1+0.2Z^{-1})(1+0.8Z^{-1})(1-0.8Z^{-1})}$$ **10**

i) Give ROC condition
ii) Sketch pole Zero diagram
iii) Find the response of the system
iv) Comment on the stability

b) A continuous time signal x (t) is given below. Sketch the following Signals: **10**
a) $x_1(t) = 2x(t)$ b) $x_2(t) = x(t-3)$
c) $x_3(t) = x(t/2)$ d) $x_4(t) = x(2t)$



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Q.5	a)	State sampling theorem. How aliasing occurs? How it can be eliminated?	**10**
	b)	Derive and sketch the ROC of any three infinite duration signals. Also comment on stability.	**10**
Q.6	a)	An 8 point sequence is given by x(n)={2,4,6,8,2,4,5,8].Compute 8 point DFT of x(n) by radix -2 DIT - FFT method.	**10**
	b)	Prove any four DFT properties	**10**

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