GOVERNMENT WOMEN ENGINEERING COLLEGE AJMER

B.TECH V SEM

MID TERM EXAMINATION

TIME: 60 MIN. MAX. MARKS: 20

DIGITAL SIGNAL PROCESSING

1. Check whether the following systems are (i) Time Invariant/Time Variant (6)
   (a) $Y(n)= x(n)- x(n-1)$
   (b) $Y(n)=n\, x(n)$
   (c) $Y(n)=x(-n)$
   (d) $Y(n)= x(n) \cos w(n)$
2. Check whether the following systems are (i) Linear/Non Linear (6)
   (a) $Y(n)=n\, x(n)$
   (b) $Y(n)= x(n^2)$
   (c) $Y(n)= x^2(n)$
   (d) $Y(n)= A\, x(n) +B$
3. The impulse response of an LTI system is given as (4)

   h (n)= { 1,2,1,-1}. Determine the response of the system to the input signal

   x(n)={ 1,2,3,1}.

OR

4. Determine the range of values of A & B for which the following LTI system with impulse response is stable:

   H(n)={ (4)
5. Determine the Fourier Transform & Energy density spectrum(S_{xx})of the signal (4)

   $x(n)= a^n\, u(n)$ $|a| <1$

OR

6. Derive the Multiplication and Convolution properties of DTFT. (4)

GOVERNMENT WOMEN ENGINEERING COLLEGE AJMER

B.TECH VII SEM

MID TERM EXAMINATION

TIME: 60 MIN. DIGITAL SIGNAL PROCESSING MAX. MARKS: 20

1. Convert the following analog filter into a digital filter using impulse invariance method.

OR

2. Design an analog Butterworth filter that has a cut off frequency of 20 rad/sec and 20dB attenuation at 40 rad/sec.
3. Convert the analog filter with transfer function

   into a

   digital filter using Bilinear Transformation method. The digital filter is required to have a resonant frequency of $\omega_r = \pi/2$

OR

4. Design a single pole digital Low pass filter with a 3dB Bandwidth of 0.2π using Bilinear Transformation method on the analog filter with system function H(s)=
5. Determine the order of a Butterworth filter that satisfy the following constraints:

   With T=01 sec.Apply impulse invariance method.

OR

6. Draw the cascade and parallel form network structure for the system
   Y(n)=3/4 y(n-1)- 1/8 y(n-2) + x(n) +1/3 x(n-1)