Department of Electronics and Telecommunication

Subject code: ETU604 **Class Test-2** **Date-9/03/2016** **Time- 1hr** **Marks-15**

Note: Each Question is for 5 marks. Solve any one from Q2 and Q3

Q1. Find the inverse DFT of Y(k) = {1, 0, 1, 0}. Use Matrix for DFT computation.

Q2. Compute DFT of the sequence x(n) = {1, 3, 3, 3}. Also sketch magnitude and phase spectrum. OR

Q3. State and prove the following properties of DFT:

   i) Periodicity   ii) Time Reversal   iii) Multiplication

Q4. Compute 8-point DFT of the discrete time signal, x(n) = {1, 2, 1, 2, 1, 3, 1, 3} using radix-2 DIT FFT

Electronics and Telecommunication Department

Class Test: 2

Subject: ETU604

Max.Marks:15

Date: 17/3/17

SOLVE ANY THREE
All Questions Carry Equal Marks

1] Convert the analog filter with system functions

$$H_a(s) = \frac{s+0.1}{(s+0.1)^2+9}$$ into a digital IIR filter by means of the impulse invariance method.

2] Explain the advantages & disadvantages of FIR filter over IIR filter.

3] If $H_a(s) = \frac{s+0.1}{(s+0.1)^2+25}$, design a digital filter using matched Z-transform for T=0.5 sec.

4] For a given specification, design an analog Butterworth LPF,

$$0.9 \leq H(j\Omega) \leq 1, \qquad 0 \leq \Omega \leq 0.2\pi$$
$$H(j\Omega) \leq 2, \qquad 0.4\pi \leq \Omega \leq \pi$$

5] Transform a given filter into a digital filter using approximation derivative method for T=1 sec if

$$H_a(s) = \frac{s+0.1}{(s+0.1)^2+16}$$ &realize.