

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE – SEMESTER – VI (OLD).EXAMINATION – WINTER 2016**

**Subject Code: 160305****Date: 24/10/2016****Subject Name: Bio-Medical Signal Processing****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What are standard Test Signals? What is the significance of it. **07**  
 (b) What is a system.Explain classification of a System? Explain any two in detail. **07**
- Q.2** (a) Explain the Amplitude Scaling Operations with an example. **07**  
 (b) Explain DFT property “Circular Time shift of sequence”. **07**
- OR**
- (b) Explain Difference Equations. Based upon length of Impulse response how the discrete Time systems are classified. **07**
- Q.3** (a) Write a short Note on All Pass System. **07**  
 (b) Develop Direct form-II realization of the Transfer Function **07**

H(Z)=

$$\frac{3 + 3.6Z^{-1} + 0.6Z^{-2}}{1 + 0.1Z^{-1} - 0.2Z^{-2}}$$

Is it advantageous than direct Form-I?

- OR**
- Q.3** (a) List the Properties of DFT .Explain any two in brief. **07**  
 (b) Calculate the DFT of a sequence  $x(n)=\{4,1-j,-2,1+j\}$ . **07**
- Q.4** (a) Define DFT & Twiddle Factor. Explain the relationship between DFT and DTFT. **07**  
 (b) Compare Decimation in Time and Decimation in Frequency Algorithms. **07**
- OR**
- Q.4** (a) Write a short note on: Goertzel Algorithm. **07**  
 (b) Discuss Bilinear Transformation for IIR Filter Designs. **07**
- Q.5** (a) Give generalized architecture of DSP Processor. List application of DSP Processor. **07**  
 (b) Write a short note on Analysis of Coefficients of Quantization Effects in FIR Filters. **07**
- OR**
- Q.5** (a) Explain DSP Application in Dual Tone Multi Frequency Signal Detection. **07**  
 (b) Discuss Window Function used in FIR Filter Design along with important Frequency Domain Characteristics. **07**

\*\*\*\*\*