

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2013****Subject code: 714204N****Date: 17-06-2013****Subject Name: Advanced DSP System and Architecture****Time: 10.30 am – 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 is the sufficient condition for the existence of DTFT? Explain Gibbs phenomenon with suitable example. **07**
- (b) Explain limit-cycle oscillations in recursive systems. **07**
- Q.2** (a) Determine the response of the FIR filter with impulse response $h(n)=\{1,2,3\}$ to the input sequence $x(n)=\{1,2,2,1\}$ **07**
- (b) How to carry out frequency analysis of discrete signal using DFT? Explain with suitable examples. **07**
- OR**
- (b) Explain divide-and-conquer approach to compute DFT. **07**
- Q.3** (a) What is the use of FFT algorithm in linear filtering and correlation? **07**
- (b) Explain design of linear-phase FIR filters by frequency-sampling method. **07**
- OR**
- Q.3** (a) Explain all-pass filter that imparts 90° phase shift on the discrete input signal. **07**
- (b) Convert the analog filter with system function **07**
- $$H_a(s) = \frac{s + 0.1}{(s+1)^2 + 9}$$
- into a digital IIR filter by means of the impulse invariance method.
- Q.4** (a) Explain the following: **07**
- (1) VLIW architecture
- (2) Pipelining
- (b) Which are the steps for code generation in CCS? Explain in detail. **07**
- OR**
- Q.4** (a) Write a program for computing 8-point DFT in C6713 using C. **07**
- (b) Draw and explain the internal architecture of TMS320C6X devices. **07**
- Q.5** (a) Write about functional units and their operation of TMS320C6X series CPU. **07**
- (b) Explain arithmetic fixed point assembly instructions of TMS320C6X series CPU. **07**
- OR**
- Q.5** (a) Explain data formats and data format conversion floating point assembly instructions of TMS320C6X series CPU. **07**
- (b) Write and explain applications of DSP in detail. **07**
