

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER- IV(NEW) EXAMINATION – SUMMER 2015

Subject Code:2141706**Date:03/06/2015****Subject Name: Analog Signal Processing****Time: 10:30am-1.00pm****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) Define the terms: (i) Input offset voltage (ii) Differential Input resistor (iii) Common mode rejection ratio (iv) supply Voltage rejection ratio (v) output voltage swing (vi) Slew Rate (vii) Long-term input offset voltage. **07**
- (b) Draw peaking amplifier specify the value of all components to provide a gain of 10 at a peak frequency of 16 KHz. Take $L = 10 \text{ mH}$ with internal resistance of 30Ω . **07**
- Q.2** (a) Draw and explain the Voltage series feedback amplifier (Non-inverting amplifier with feedback), also derive the closed loop voltage gain. **07**
- (b) Draw only the offset voltage compensating network design only for inverting and non-inverting op-amp. **07**
- OR**
- (b) Draw and explain the Inverting configuration Summing amplifier, Scaling amplifier, Averaging amplifier. **07**
- Q.3** (a) Write short note on: Triangular Wave Generator **07**
- (b) Draw and explain the 9400 V/F converter equivalent circuit, waveforms and its working. **07**
- OR**
- Q.3** (a) Explain with necessary diagrams the working of AC amplifiers (inverting and non-inverting) with single supply voltage. **07**
- (b) Draw the differential amplifier with one op-amp and derive its voltage gain. **07**
- Q.4** (a) Draw op-amp based full wave rectifier (absolute-value output) circuit. Explain its working with necessary input/output waveforms. **07**
- (b) Explain working of op-amp based Schmitt trigger circuit along with schematic and input/output waveforms. **07**
- OR**
- Q.4** (a) Draw the Basic comparator and explain its working in detail with waveforms. **07**
- (b) Draw and explain the Active First order low pass butter worth filter with its transfer function. **07**
- Q.5** (a) Draw and explain the 555 timer pin connection diagram and block diagram. **07**
- (b) What is an instrumentation amplifier? Explain with the help of neat diagram the operation of an instrumentation amplifier employing three basic op-amps. **07**
- OR**
- Q.5** (a) Describe application of 555 timer as an astable multivibrator circuit. Obtain expressions for frequency of operation and duty cycle. **07**
- (b) Write short note on: Wien Bridge Oscillator. **07**
