

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI- EXAMINATION – SUMMER 2016****Subject Code:160801****Date:19/05/2016****Subject Name:Integrated Circuits & Application****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) Define Op-Amp. Draw and explain block diagram representation of a typical Op-Amp. **07**
- (b) Explain following performance parameters of Op-Amp. **07**  
(i) Input Offset Voltage (ii) PSS (iii) Input Bias Current (iv) CMRR (v) Slew Rate.
- Q.2** (a) What is an ideal Op-Amp? Explain the equivalent circuit of an Op-Amp. **07**
- (b) Draw and explain the block diagram of IC 555 Timer. **07**
- OR**
- (b) Explain Op-amp as a Schmitt trigger. **07**
- Q.3** (a) Write a short note on Absolute value output circuit. **07**
- (b) Explain the operation of V-I converter with grounded load. **07**
- OR**
- Q.3** (a) Discuss the zero crossing detector with its circuit diagram. **07**
- (b) Explain precision Full Wave Rectifier in detail. **07**
- Q.4** (a) Derive the mathematical expression for the output voltage of integrator. **07**
- (b) Write a short note on Sample and Hold circuit. **07**
- OR**
- Q.4** (a) Explain Astable multi-vibrator using Op-Amp. **07**
- (b) Design an op-amp differentiator that will differentiate an input signal with  $f_{\max}=100$  Hz. Draw the output waveform for a sine wave of 1V peak at 100Hz applied to the differentiator. **07**
- Q.5** (a) Explain the operation of Phase Locked Loop with its block diagram. **07**
- (b) Explain differential input differential output amplifier. **07**
- OR**
- Q.5** (a) What is an Instrumentation Amplifier? Explain it with suitable example. **07**
- (b) Explain the operation of Phase Locked Loop with its block diagram. **07**

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