

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject Code: 160801****Date: 26-11-2014****Subject Name: Integrated Circuits and Application****Time: 02:30 pm - 05:00 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) Draw and Explain the block diagram representation of a typical Op-Amp. **07**
- (b) Draw and explain the functional block diagram of IC 555. **07**

- Q.2** (a) What is an ideal Op-Amp? Explain the equivalent circuit of an Op-Amp. **07**
- (b) Explain following performance parameters of Op-Amp. (i) Input Offset Voltage (ii) Input Offset Current (iii) Input Bias Current (iv) CMRR (v) Slew Rate. **07**

**OR**

- (b) Derive the expression for Voltage gain ( $A_V$ ) and input resistance with feedback ( $R_{IF}$ ) for voltage series feedback amplifier. **07**
- Q.3** (a) Draw non-inverting amplifier using Op-Amp and derive the expression for its output voltage. **07**
- (b) Explain the Peaking Amplifier. **07**

**OR**

- Q.3** (a) Explain the Ideal and practical differentiator circuit with its frequency response. **07**
- (b) Explain Instrumentation Amplifier using transducer bridge with its application. **07**
- Q.4** (a) Describe a sample and hold circuit and give its applications. **07**
- (b) What are precision rectifiers? Explain the operation of half wave positive & negative precision rectifier. **07**

**OR**

- Q.4** (a) Explain the operation of Phase Locked Loop with its block diagram **07**
- (b) Explain IC 555 as a Monostable multivibrator with wave shaping network. Design the circuit to produce a time delay of 10ms. **07**
- Q.5** (a) Explain Astable multivibrator using Op-Amp. **07**
- (b) Write short note on Basic Log Amplifier using diode. **07**

**OR**

- Q.5** (a) Explain summing, scaling and averaging amplifier using Op-Amp. **07**
- (b) Write a short note on Schmitt trigger. **07**

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