

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE SEM-VI Examination-Nov/Dec-2011**

**Subject code: 160801**

**Date: 21/11/2011**

**Subject Name: Integrated Circuits & Application**

**Time: 10.30 am -1.00 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)** Which power supply is used for the op-Amp? How we can obtain dual supply from single supply? **07**  
**(b)** Explain the significance of virtual ground and virtual short. **07**

- Q.2 (a)** Explain the various offset nulling techniques used in op-amp. **07**  
**(b)** Define Rise time. Derive the relation between the Rise time and cut-off frequency of the op-amp. **07**

**OR**

- (b)** How the input offset voltage effects the output of the op-amp? **07**

- Q.3 (a)** Show that the output of the subtractor is proportional to the difference between the two input voltages. **07**  
**(b)** In an inverting adder circuit the input voltages are 0.3V, 0.5V, 0.1V while  $R_1=R_2=R_3=1K\Omega$ . If  $R_f=10K\Omega$ , Calculate the output voltage. **07**

**OR**

- Q.3 (a)** What is an Instrumentation Amplifier? Explain it with suitable example. **07**  
**(b)** Draw & explain differential input differential output amplifier. **07**

- Q.4 (a)** Explain Op-amp as a Schmitt trigger. **07**  
**(b)** Explain the operation of monostable multivibrator using op-amp. **07**

**OR**

- Q.4 (a)** Explain the operation of V-I converter with grounded load. **07**  
**(b)** Draw and explain the operation of peak detector. **07**

- Q.5 (a)** Discuss the zero crossing detector with its circuit diagram. **07**  
**(b)** Explain the practical integrator circuit. Explain its advantages. Also draw its frequency response. **07**

**OR**

- Q.5 (a)** Draw and explain the functional block diagram of IC 555. **07**  
**(b)** What is Op-Amp? Draw and explain typical block diagram of the op-amp. **07**