

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 715403N**Date: 03-01-2014****Subject Name: Electronic System Design****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) Draw the typical circuit diagram of OP-AMP in inverting and non-inverting mode with two resistors. Obtain expressions of their voltage gain. **07**

(b) Explain the following parameters of OP-AMP: **07**
(i) Slew rate
(ii) Common Mode Rejection Ratio
(iii) Power Supply rejection Ratio
(iv) Input Offset Voltage

Q.2 (a) Explain the following methods of D/A conversion: **07**
(i) Parallel method
(ii) Weighting method
(iii) Counter method

(b) Draw the circuit diagram of a full wave bridge rectifier. Obtain the expression of average and rms value of load voltage for resistive load. **07**

OR

(b) Explain the successive approximation A/D converter. **07**

Q.3 (a) Draw the basic circuit diagram of a BiCMOS inverter with resistive load. Discuss the switching delay in BiCMOS logic circuits. **07**

(b) Write a short note on BiCMOS applications. **07**

OR

Q.3 (a) Write short notes on: **07**
(i) Controllability and Observability
(ii) Ad Hoc testable Design Techniques

(b) Obtain the expressions of V_{OH} , V_{OL} , V_{IL} and V_{IH} of a resistive load CMOS inverter. **07**

Q.4 (a) Write short notes on: **07**
(i) Scan-Based Techniques
(ii) Built-In Self Test Techniques

(b) Consider a CMOS inverter circuit with the following parameters: **07**
 $V_{DD} = 3.3 \text{ V}$
 $V_{TO,n} = 0.6 \text{ V}$
 $V_{TO,p} = -0.7 \text{ V}$
 $K_n = 200 \mu \text{ A} / \text{V}^2$
 $K_p = 80 \mu \text{ A} / \text{V}^2$
 $K_R = 2.5$
Calculate the noise margins of the circuit.

OR

- Q.4** (a) Draw the models for Electro Static Discharge testing. Also draw a typical ESD protection network circuit. **07**
(b) Write a short note on Electromagnetic Compatibility. **07**
- Q.5** (a) Obtain the expression of switching power dissipation of CMOS inverter. **07**
(b) Discuss the issues related to grounding of Electronic Systems in brief. **07**
- OR**
- Q.5** (a) Draw the typical circuit diagrams of a typical active low pass , high pass and band pass filters. **07**
(b) Enlist the important packaging concerns of Electronic circuits. Explain the following package types: DIP,PGA,CCP,QFP,MCM **07**
