Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEM-III Examination-Dec-2011

Subject code: X30902 **Date: 15/12/2011**

Subject Name: Analog & Digital electronics **Time: 2.30 pm -5.00 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)** Why NAND & NOR gates are known as universal gate? Realize all other gates using NOR gates. **07**

(b) Do as Directed **07**

1. $(46)_{10}$ = (_____)$_{\text{gray code}}$ 01
2. $(39)_{10}$ = (_____)$_{\text{Ex-3}}$ 01
3. $(214)_{10}$ = (_____)$_{8}$ 01
4. $(25.26)_{10}$ = (_____)$_{2}$ 01
5. $(FAE)_{16}$ = (_____)$_{8}$ 01
6. $(43)_{10}$- $(25)_{10}$ using 2's complement method. 02

Q.2 **(a)** List and discuss characteristics of an ideal Op-amp. **07**

(b) Draw Block diagram of Op-amp and Explain function of each block. **07**

OR

(b) State & Explain De'Morgan's 1st & 2nd Law. **07**

Q.3 **(a)** Explain ideal Inverting & Non-inverting amplifier. **07**

(b) Classify various ADC conversion technique & Explain Successive Approximation type ADC converter. **07**

OR

Q.3 **(a)** Explain Inverting and Non-inverting type Zero crossing Detector. **07**

(b) 1. Compare Inverting & Non-inverting amplifier. **07**

2. Compare Schmitt trigger & Comparator.

Q.4 **(a)** Reduce the following function using K-Map technique and Draw its AOI diagram **07**

$$f(A,B,C,D) = \sum m(0,1,4,8,9,10)$$

(b) Simplify & Draw AOI diagram of following expression. **07**

1. $AC + C(A + \overline{A}B)$
2. $\overline{A}BC\overline{D} + \overline{A}BCD + ABD$

OR

Q.4 **(a)** 1. Define: **07**

1) Fan-in 2) Fan-out3) Speed power product/FOM 03

2. Explain Dual input TTL NAND gate. 04

(b) Derive Full Adder with necessary truth table & K-Map. Also express it with AOI logic diagram. **07**

Q.5 **(a)** Explain Weighted Resistor type DAC converter. **07**

(b) Explain Astable Multi vibrator using 555 timer IC. **07**

OR

Q.5 **(a)** Classify Shift Registers. Explain Serial In Parallel Out and Parallel In Parallel Out Shift Registers. **07**

(b) What is Decoder? Explain 3 to 8 decoder circuit using truth table and logic diagram. **07**

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