Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Remedial Examination March 2010

Subject code: 130902 **Subject Name:** Analog & Digital Electronics

Date: 10 / 03 / 2010 **Time: 03.00 pm – 05.30 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)** Discuss universality of NOR gate. Also Derive all gates with the help of NOR gate **07**

(b) Derive Full Adder with the help of necessary truth table, K – Map. Also express in AOI logic diagram. **07**

Q.2 **(a)** List and Discuss all ideal characteristics of an Op Amp **07**

(b) Write Short Note on following

i. Summing Amplifier **02**

ii. Integrator **02**

iii. Merits and demerits of active filters **03**

OR

(b) Draw functional block diagram of IC 555 & discuss function of each pin. **07**

Q.3 **(a)** Draw & Discuss IC 555 as astable multivibrator **05**

(b) Explain R – 2R ladder DAC with necessary diagrams. **05**

(c) Discuss PLL with necessary diagrams. **04**

OR

Q.3 **(a)** (i) $(128.255)_{10} = (\_\_\_\_\_)_2$ **07**

(ii) $(255.255)_8 = (\_\_\_\_\_)_2$

(iii) $(2345.99)_{10} = (\_\_\_\_\_)H$

(iv) $(1011)_2 - (1101)_2 = \_\_\_\_\_$

(v) $(7654)_8 = (\_\_\_\_\_)H$

(vi) Subtract using 1's complement $(5)_{10} - (6)_{10} = (\_\_\_\_\_)_2$

(vii) $(1010)_2 / (101)_2 = \_\_\_\_\_$

07

(b) For given function $F = X\overline{Y} + X Y$, Find complement of F

Q.4 **(a)** Minimize the following Boolean expression using K-map and realize it using AOI gates. **07**

$$Y = \sum m (0,2,7,8,9,10,12,13,14)$$

(b) Realize & draw the following equation using only NOR gates. **07**

$$Y = (\overline{AB + C})\, D$$

OR

Q.4 **(a)** Minimize the following Boolean expression using K-map and realize it using AOI gates. **07**

$$Y = \prod M (0,2,7,8,9,10,12,13,14)$$

(b) Reduce & draw the following equation using only NAND gates. **07**

$$Y = (\overline{AB} + \overline{B+C})\, \overline{A}\,\overline{B}\,\overline{C}$$

Q.5	**(a)**	Define and discuss voltage parameters of Digital ICs and give expression for V_{NH} & V_{NL}	**07**
	(b)	Discuss multiplexers & demultiplexers with suitable diagram.	**07**

OR

Q.5	**(a)**	Give classification of registers. Discuss 4 – bit buffer register using D – flip flop.	**07**
	(b)	Explain priority encoder with the help of truth table, K – Map & AOI Implementation.	**07**

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