Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Remedial Examination May 2011

Subject code: 130902 Subject Name: Analog & Digital Electronics

Date: 27-05-2011 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)** What are the feedback configurations? Draw an Op-amp circuit with voltage series feedback and Derive an expression for it,. **07**

(b) Draw the circuit for dual input balanced output differential amplifier using constant current bias circuit. Why current mirror circuit preferred to constant current bias for differential amplifier **07**

Q.2 **(a)** Draw and Explain the use of op-amp as a zero crossing detector **07**

(b) What do you mean by input offset voltage? Draw and explain offset voltage compensating network **07**

OR

(b) Sketch the circuit of Op-amp as Differentiator and explain with necessary waveforms. **07**

Q.3 **(a)** Sketch the diagram of 555 timers as an astable multivibrator having 50% duty cycle. Explain it's working and derive equation for frequency of output waveform. **07**

(b) Discuss the main features of IC 78 and 79 series voltage regulators. **07**

OR

Q.3 **(a)** (i) $(105.15)_{10} = (\_\_\_\_\_)_2$ **07**

(ii) $(378.93)_8 = (\_\_\_\_\_)_2$

(iii) $(2598.675)_{10} = (\_\_\_\_\_)H$

(iv) $(1100.10)_2 - (111.01)_2 = \_\_\_\_\_$

(v) $(756.603)_8 = (\_\_\_\_\_)H$

(vi) Subtract with unsigned binary no using 2's complement of subtrahend : 11010 - 10000

(vii) Perform the decimal subtraction in the 8421 BCD code : 206.7-147.8

(b) Realize Exclusive OR gate using NAND logic and NOR logic. **07**

Q.4 **(a)** List the various logic families available and explain in brief the specifications of Digital IC'S. **07**

(b) Describe the operation preformed by following circuits in brief (1) Full Adder (2) Parallel Adder **07**

OR

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

$Y = \Sigma m (0,1,2,3,5,7,8,9,10,12,13)$

	(b)	What is Multiplexer? Explain basic n input multiplexer with necessary logic diagrams and truth table. List some applications of Multiplexer.	**07**
Q.5	**(a)**	Explain in detail the working of Master-Slave J-K flip-flop	**07**
	(b)	With the help of neat circuit diagram explain the working of: (1) A two input TTL NAND gate. (2) A two input CMOS NOR gate.	**07**

OR

Q.5	**(a)**	Write short notes on (i) Parallel in Serial out shift register (ii) Binary ripple counter	**10**
	(b)	Compare the CMOS and TTL logic.	**04**

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