Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E SEM-V Examination-Nov/Dec.-2011

Subject code: 151006 **Date: 03/12/2011**

Subject Name: Applied Electronics

Time: 02.30 pm-05.00 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)**	Justify load current variation with change in load for a practical current source. Classify dependent sources and explain each of them with the help of figures.	**07**
	(b)	Explain any four characteristics of a practical Operational Amplifier. Design a unity gain circuit of an operational amplifier that has only one input at the non-inverting terminal.	**07**
Q.2	**(a)**	Draw the block diagram of an LVDT and plot its characteristics. The output of an LVDT is connected to a 5V voltmeter through an amplifier whose amplification factor is 250. An output of 2 mV appears across the terminals of LVDT when the core moves through a distance of 0.5 mm. The milli voltmeter scale has 100 divisions. Draw the block diagram of the whole set up. Calculate the sensitivity of the LVDT and that of the whole set up. Calculate the resolution of the instrument in mm.	**07**
	(b)	Explain the application of astable multivibrator as a square wave oscillator using a diode.	**07**
		OR	
	(b)	Draw the block diagram of IC 555 and discuss the function of trigger and control voltage pins.	**07**
Q.3	**(a)**	Write a short note on strain gauge transducers.	**07**
	(b)	How are decimal points indicated in a 7 segment display? Compare among PN junction diode, LED and LCD.	**07**
		OR	
Q.3	**(a)**	Define secondary emission. List comparison among LDR, photodiode and phototransistor.	**07**
	(b)	What is an optocoupler/optoisolator? Explain any one application of the same.	**07**
Q.4	**(a)**	Explain alt/chop method. Differentiate among CRO, digital storage oscilloscope and mesh storage CRT.	**07**
	(b)	Chart the VI characteristics of the 4 layer diode. Explain the rate effect for a p-n-p-n diode.	**07**
		OR	
Q.4	**(a)**	Draw the equivalent circuit of UJT and plot its characteristics.	**07**
	(b)	Write a short note on bar code scanner and decoder.	**07**
Q.5	**(a)**	Evaluate [1] (A+ B'+AB)(A+B')(A'B) Prove De Morgan's laws.	**07**

	(b)	Design a combinational logic circuit whose output is high only when majority of inputs (A,B,C,D) are low. Obtain the expression and implement it.	**07**

OR

Q.5	**(a)**	Write a short note on edge triggered toggle flip flop.	**07**
	(b)	Compare the microcontroller with a microprocessor.	**07**

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