(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

FOURTH SEMESTER [B.TECH.] MAY-2010

Paper Code: ETEC204/ETEE204 Subject: Analog Electronics-II
Paper Id: 28204

Time : 3 Hours Maximum Marks :75

Note: Attempt one question from each unit. Q.1 is compulsory. Internal choice is indicated.

Q1 (a) Explain the function of all the basic building blocks of an op-amp.
(b) What is the importance of current mirror? Draw the circuit of the basic current mirror and explain its working.
(c) List the important features of an Instrumentation amplifier. Draw the circuit of a practical Instrumentation amplifier and find an expression for its output voltage.
(d) What types of fixed voltage regulators are available? Show the standard representation and discuss main characteristics.
(e) Draw the circuit of an All-Pass filter and find its transfer function. Give an application of All-Pass filter. **(5x5=25)**

UNIT-I

Q2 (a) Draw the circuit of a MOSFET source coupled differential amplifier. Derive an expression for its CMRR. **(6.5)**

(b) Draw the circuit of a Wilson current source and show that its output current is almost equal to the reference current. **(5)**

OR

Q3 (a) Discuss the external compensating techniques used in op-amps. Compare their performance. **(6.5)**

(b) The time constant (RC) of an op-amp integrator circuit is 0.1ms. Determine the output response for the following input signals:- **(6)**

(i) 1V peak sine wave at 5KHZ.

(ii) Step voltage V_i=1V for $0 \le t \le .5ms$.

(iii)2V P-P square wave of 5KHz.

Draw the input and output waveforms.

UNIT-II

Q4 (a) Draw the circuit of a multivibrator which can generate a single output pulse of duration T. Explain the working and derive the expression for the pulse width T. **(6.5)**

(b) Draw the circuit of an op-amp oscillator to generate radio frequency signals. Determine the expression for the frequency of oscillation and the condition for oscillation. **(6)**

OR

Q5 (a) Explain the working of a square waveform generator and derive an expression for the frequency of oscillation. Suggest a method for obtaining asymmetrical square wave. **(6.5)**

(b) For an RC-phase shift oscillator, derive the expression for the frequency of oscillation and condition for sustained oscillation. **(6)**

P.T.O.

P1

UNIT-III

Q6 (a) For the circuit shown in fig.1, find the output voltage waveform for a sine wave input signal. **(6.5)**

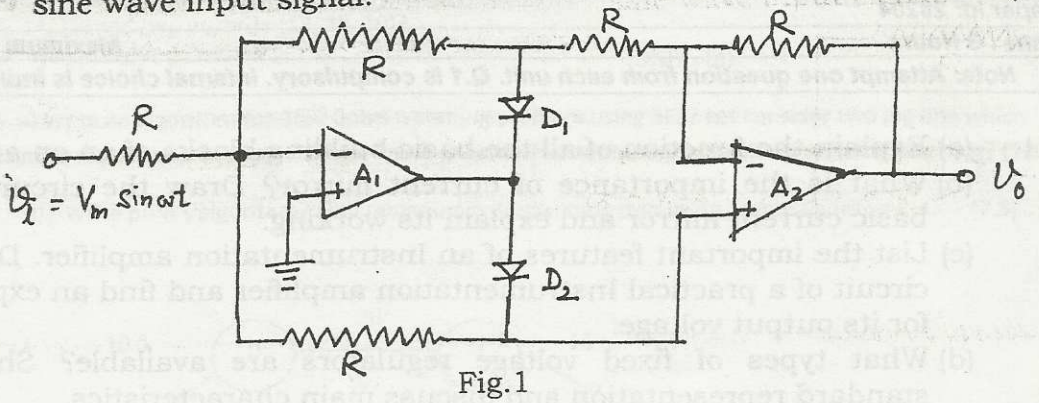

Fig.1

(b) Draw and explain the working of a complementary symmetry push-pull amplifier. Derive an expression for its efficiency. **(6)**

OR

Q7 (a) A comparator circuit using positive feedback is shown in fig.2. A sine wave input is applied. Derive the output response. Explain Hysterisis in this circuit. **(6.5)**

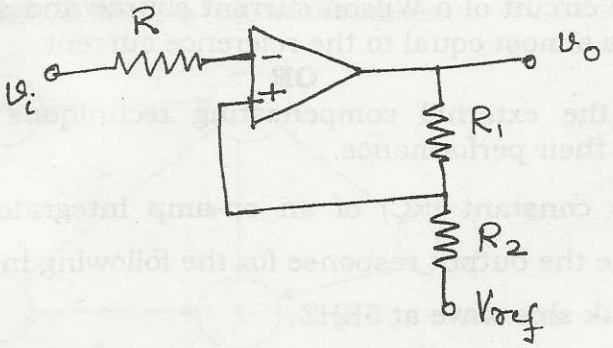

Fig.2

(b) Draw the circuit of a log amplifier and derive the expression for the output voltage. Is the circuit independent of temperature? **(6)**

UNIT-IV

Q8 (a) Draw the circuit of a second-order low-pass filter and derive an expression for its transfer function for a maximally flat response in the pass band. **(6.5)**

(b) Draw the block schematic of a PLL and explain the function of each block. **(6)**

OR

Q9 (a) Draw the circuit of a notch filter and derive an expression for its transfer function. **(6)**

(b) Draw a block schematic of voltage controlled oscillator (VCO). Explain its working and derive an expression for its frequency. **(6.5)**

****