

7/01/10

(3 Hours)

[Total Marks : 100

Analog Integrated Circuits & Applications

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N.B. : (1) Question No. 1 is compulsory.

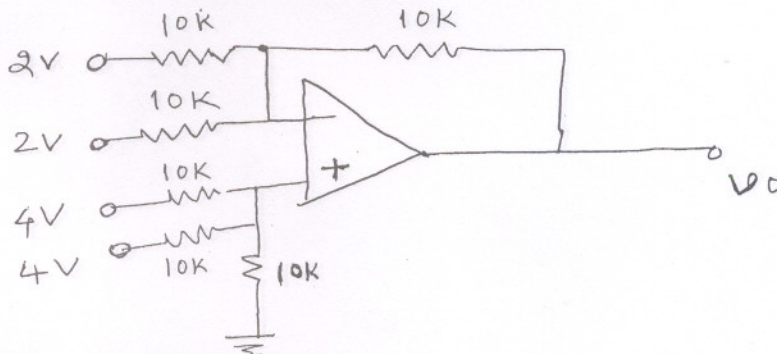
(2) Attempt any four questions from remaining six questions.

(3) Assume suitable data if required and state clearly.

2.30 to 5.30.

1. (a) Draw basic differentiator circuit and derive an expression for output voltage. Explain why this circuit is sensitive to high frequency noise. 5
- (b) Explain various electrical parameters of 741C OP-AMP and give the range of values specified in data sheet. 5
- (c) Draw transfer characteristics of OP-AMP 741C. Explain working of OP-AMP as Noninverting comparator. Draw waveforms. 5
- (d) Derive an expression for OP-AMP as an inverting amplifier. 5
2. (a) Draw circuit diagram for Instrumentation Amplifier using three OP-AMPs. Derive an expression for output voltage. 10

(b) Find v_o for



- (c) Draw circuit diagram for peak detector and explain working. 5
3. (a) Draw circuit diagram for precision full wave rectifier. Explain working by drawing equivalent circuits for $v_i > 0$ and for $v_i < 0$. Draw necessary waveforms. 10
- (b) What are the different types of digital to analog converters? Explain one of the techniques in detail. 10
4. (a) Draw functional diagram of Astable Multivibrator using timer 555. Derive an expression for time period T. 10
- (b) In Astable multivibrator, $R_A = 6.8k \Omega$, $R_B = 3.3 k \Omega$, $C = 0.1 \mu F$, calculate – 10
 - (i) t_{High}
 - (ii) t_{Low}
 - (iii) free running frequency
 - (iv) duty cycle.
5. (a) Design a low pass, second order KRC filter using equal component design using $f_0 = 1KHz$ and $Q = 5$. What is its dc gain? 10
- (b) Draw functional diagram of PLL 565 and explain its working. 10

6. (a) Draw circuit diagram for inverting Schmitt Trigger. Explain working and write an equation for V_{LTP} and V_{UTP} . 10
- (b) Design phase shift oscillator with $f_0 = 4$ KHz. 10
7. Write short notes on any **two** of the following :- 20
- (a) Waveform generator IC 8038
 - (b) Three pin regulators
 - (c) Analog to digital converters
 - (d) IC 723.
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