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T 3230

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Fourth Semester

Electronics and Instrumentation Engineering

EC 1313 — LINEAR INTEGRATED CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulation 2004)

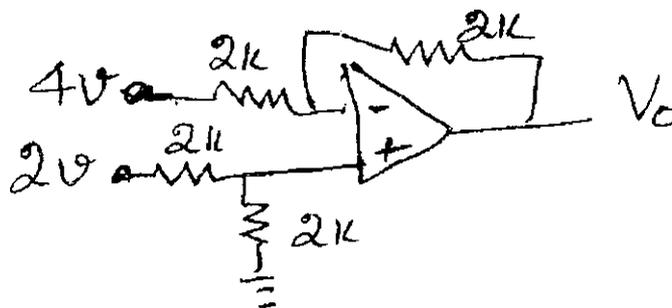
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of CMOS Ics?
2. What is meant by ion implantation? Mention its advantages.
3. Find V_o for the following circuit shown in figure.



4. Draw the circuit diagram of an opamp integrator state the reason for preferring integrators over differentiators in analog computers.
5. Enlist the important properties of an instrumentation amplifier.
6. What is a clamper circuit?

7. Draw the basic building blocks of a PLL circuit.
8. Mention any four applications of 555 timer.
9. What are the limitations of linear voltage regulators?
10. Draw the circuit diagram of an optocoupler and state the important features of an optocoupler circuit.

PART B — (5 × 16 = 80 marks)

11. (a) (i) How MOSFET is produced using Monolithic IC technology. (10)
- (ii) Explain the process of metallization in IC fabrication. (6)

Or

- (b) (i) Briefly explain how a n-p-n transistor is fabricated using the fundamentals of monolithic technology. (10)
- (ii) Explain different types of isolation techniques used in IC fabrication. (6)
12. (a) (i) Design an op amp circuit to give an output voltage $V_o = 5V_1 - 2V_2 - 3V_3$ where V_1, V_2 and V_3 are input voltages. (6)
- (ii) Briefly explain various methods used to provide very high CMRR. (10)

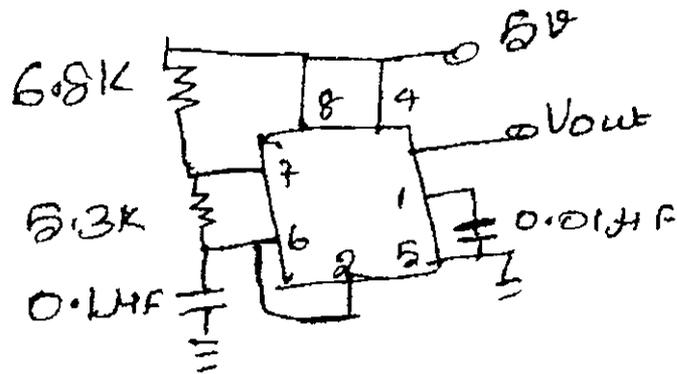
Or

- (b) (i) With circuit schematic explain input offset voltage and input bias current. How these parameters are measured? (10)
- (ii) Explain the operation of differentiator circuit using opamp. (6)
13. (a) (i) Draw the functional diagram of successive approximation type A/D converter and explain its principle of operation. (10)
- (ii) What is a Peak Detector? Explain. (6)

Or

- (b) (i) With circuit diagram explain the principle of operation of saw tooth wave form generator using opamp. (10)
- (ii) Discuss about V/I converter using opamp. (6)

14. (a) (i) For the circuit shown in figure



Calculate t_{ON} , t_{OFF} , Duty cycle and free running frequency. (12)

- (ii) Explain the terms lock range, capture range with respect to PLL (4)

Or

- (b) (i) Explain the following applications of PLL

(1) Frequency multiplier

(2) FM delector.

(10)

- (ii) State the important features and the applications of multiplier IC AD 533. (6)

15. (a) Write a technical note on switched mode power supply.

Or

- (b) With circuit schematic explain the working principle of ICL 8038 function generator.