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Question Paper Code: 31352

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Third Semester

Electronics and Instrumentation Engineering

01UEI302 - LINEAR INTEGRATED CIRCUITS AND APPLICATIONS

(Regulation 2013)

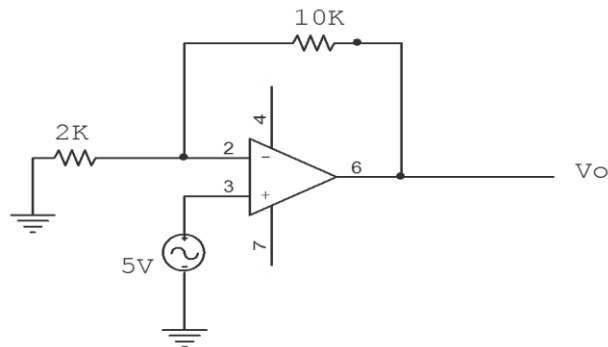
Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Why is ion-implantation preferred over diffusion?
2. Name the various types of IC packages.
3. Define slew rate.
4. For the op-amp shown in below figure, determine the voltage gain.



5. Enlist the important properties of an instrumentation amplifier.

6. Calculate the number of comparators required for realizing a 8bit flash type A/D converter.
7. Draw the basic building blocks of a PLL circuit.
8. Mention any four applications of IC555 timer.
9. What is thermal shutdown?
10. Define voltage regulator and mention its types.

PART - B (5 x 16 = 80 Marks)

11. (a) Describe in detail the various steps involved in the process of IC fabrication. (16)

Or

- (b) Write a detailed note on fabrication of resistor and capacitor on monolithic ICs. (16)

12. (a) (i) Design an op amp circuit to give an output voltage $V_o = - (0.1V_1 + V_2 + 10V_3)$ where V_1, V_2, V_3 are input voltages. (4)

- (ii) With circuit schematic explain input offset voltage and input bias current. (12)

Or

- (b) (i) Design an op-amp differentiator that will differentiate an input signal with frequency $f_{max}=100Hz$. (8)

- (ii) Explain the working of an integrator using operational amplifier. (8)

13. (a) With the circuit diagram, discuss the following applications of operational amplifier:

- (i) Sample and hold circuit (6)

- (ii) Comparator (5)

- (iii) V/I converter (5)

Or

- (b) (i) Draw the functional diagram of successive approximation type A/D converter and explain its principle of operation. (10)

- (ii) Draw a neat R-2R ladder DAC and explain its principle. (6)

14. (a) (i) Explain the functional block diagram of IC 555. (8)
- (ii) A 555 timer is configured to run as astable multivibrator with $R_A = 4\text{ k}\Omega$ and $R_B = 2\text{ k}\Omega$ and $C = 0.1\text{ }\mu\text{F}$. Calculate
- | | |
|-----------------------------|----------------------|
| (1) t_{HIGH} | (2) t_{LOW} |
| (3) frequency of the output | (4) duty cycle (8) |

Or

- (b) (i) With help of circuit explain the operation of 566 voltage controlled oscillator. Discuss any two applications of it. (12)
- (ii) With relevant diagram explain the following terms with respect to PLL:
- | | |
|-------------------|-----------------------|
| (1) Capture range | (2) Lock-in range (4) |
|-------------------|-----------------------|
15. (a) With suitable schematic diagram describe the functioning of an 8038 function generator IC. (16)

Or

- (b) Write short notes on
- | | |
|------------------|----------------------------------|
| (i) Opto coupler | (ii) Isolation amplifier IC (16) |
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