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Question Paper Code : 80339

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fourth Semester

Electronics and Communication Engineering

EC 6404 — LINEAR INTEGRATED CIRCUITS

(Common to Medical Electronics and Robotics and Automation Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

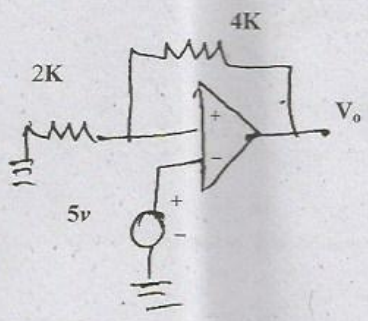
Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw the block diagram of a general opamp.

2. Draw the circuit diagram of a symmetrical emitter coupled differential amplifier.

3. For the opamp shown in figure determine the voltage gain.



4. Draw the circuit diagram of a peak detector with waveforms.

5. Draw the block diagram of IC 566 VCO (Voltage Controlled Oscillator).

6. Enlist any four applications of NE 565 PLL.

7. What are the advantages of inverted R – 2R (current type) ladder D/A converter over R – 2R (voltage type) D/A converter?

8. What is the need for electronic switches in D/A converter?

9. Draw the block schematic of IC 555 timer.

10. What is the function of a voltage regulator? Name few IC voltage regulators.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the significance of virtual ground in an opamp. (6)

(ii) With diagram explain the operation of an inverting amplifier in closed loop configuration. Obtain the expression for closed loop gain. (6)

(iii) Assuming a slew rate for 741 IC is 0. 5 $v/\mu s$. What is the maximum undistorted sinewave that can be obtained for 12 v peak. (4)

Or

(b) (i) Explain the operation of a current mirror circuit. (6)

(ii) Compare the features of ideal and practical opamp circuit. (6)

(iii) A differential amplifier has CMRR = 1000. Differential inputs $V_1 = 1100 \mu v$ and $V_2 = 900 \mu v$. Calculate the difference in output voltage if the differential gain AD = 25000 (4)

12. (a) (i) Differentiate between low pass, high pass, band pass and band reject filter. Sketch the frequency plot. (6)

(ii) Design a second order low pass Butter worth filter for a cut off frequency of 1 KHz. (10)

Or

(b) Write short notes on :

(i) Clipper and clamper circuits. (10)

(ii) Integrater. (6)

13. (a) Explain the operation of a variable transconductance multiplier. (16)

Or

(b) (i) With block schematic explain the working principle of PLL IC NE 565. (12)

(ii) Brief the application of PLL IC for frequency multiplication. (4)

14. (a) (i) With a neat sketch explain the working principle of flash type A/D converter. (10)

(ii) An 8 bit A/D converter accepts an input voltage signal of range 0 to 10 *v*.

(1) What is the minimum value of the input voltage required to generate a change of 1 LSB? (3)

(2) What input voltage will generate all '1's at A/D converter output? (3)

Or

(b) With functional block diagram explain A/D converter using voltage to time converter with input and output waveforms. (16)

15. (a) Write a technical note on : (8 + 8)

(i) isolation amplifier

(ii) opto coupler.

Or

(b) (i) Discuss the functionalities and working of switched mode power supply. (12)

(ii) Design a monostable multivibrator using 555 timer for a pulse period of 2 ms. (4)
