Total No. of Questions—**8**] [Total No. of Printed Pages—**4**

Seat No.	

[4757]-1046

S.E. (E&TC/Electronics Engineering) (Second Semester)

EXAMINATION, 2015

INTEGRATED CIRCUITS

(2012 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Answer Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6**, Q. No. **7** *or* Q. No. **8**.

(*i*) Neat diagrams must be drawn wherever necessary.

(*ii*) Figures to the right indicate full marks.

(*iii*) Use of calculator is allowed.

(*iv*) Assume suitable data if necessary.

1. (*a*) Draw the block diagram of op-amp and explain the function of each block in detail. [6]

(*b*) Compare different types of op-amp technologies. [3]

(*c*) Explain the effect of temperature on : [3]

(*i*) Input Bias Current

(*ii*) Input Offset Voltage

(*iii*) Input Resistance.

P.T.O.

Or

2. (*a*) Find the Q-point V_C and I_B for dual input balanced output differential amplifier when, $R_E = R_C = 65\ k\Omega$. [6]

Assume $I_E = I_C$, $\beta = 100$ for both transistors Q_1 and Q_2; $V_S = \pm 12$ V.

(*b*) What is the need of frequency compensation ? Explain any *one* method of frequency compensation. [6]

3. (*a*) Design a lossy integrator with square wave input of 2 V_{p-p} and 5 kHz frequency. Draw input and output waveforms. [6]

(*b*) Explain with a neat circuit diagram working of symmetric Schmitt trigger using op-amp. Also derive the equation for the trigger points. [6]

Or

4. (*a*) Design an adder using op-amp to get output expression as : [6]

$$V_o = -(2V_1 + 3V_2 + 5V_3)$$

Where V_1, V_2 and V_3 are inputs.

(*b*) Draw and explain square wave generator using op-amp. [6]

5. (*a*) With a neat circuit diagram, explain voltage to frequency converter. [5]

(*b*) Write a short note on Binary weighted Digital to Analog Converter (DAC). [5]

(*c*) What output voltage would be proudced by a D/A converter whose output range is 0 to 10 V and input binary number is : [3]

(*i*) 10 (for a 2-bit DAC converter)

(*ii*) 0110 (for a 4-bit DAC)

(*iii*) 10111100 (for a 8-bit DAC).

Or

6. (*a*) Write a short note on Flash type Analog to Digital Converter. [5]

(*b*) What are the different types of V to I converter. Explain any *one*. [5]

(*c*) List various specifications of ADC. [3]

7. (*a*) With the help of neat block diagram explain operation of PLL. [5]

(*b*) What is the need of current boosting circuit ? Explain with the help of any *one* circuit. [5]

(*c*) Draw block diagram of frequency multiplier. Draw input-output waveforms. [3]

Or

8. (*a*) For PLL circuit shown in Fig. 1, calculate the following : [6]

(*i*) Free running frequency

(*ii*) Lock range

(*iii*) Capture range.

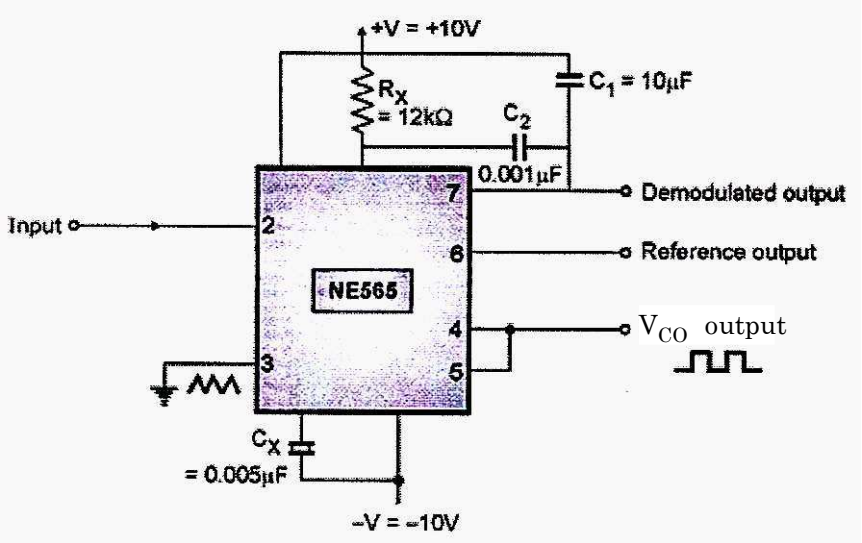

Fig. 1

(*b*) Write a short note on practical voltage regulator using LM317. [5]

(*c*) Explain the following terms : [2]

(*i*) Load Regulation

(*ii*) Line Regulation.