B.Tech Odd Semester (CBCS) Exam., December—2016

ELECTRONICS AND TELECOMMUNICATION ENGINEERING

(7th Semester)

Course No. : ETC–701

(Linear Integrated Circuits)

Full Marks : 75
Pass Marks : 30

Time : 3 hours

Note : 1. Answer **one** question from each Unit.
2. Begin each answer in a new page.
3. Answer parts of a question at a place.
4. Assume reasonable data wherever required.
5. The figures in the margin indicate full marks for the questions.

UNIT—I

1. *(a)* Explain the following : 10

(i) Offset Current

(ii) Offset Voltage

(iii) Common Mode Gain

(iv) Slew Rate

(v) CMMR

(b) Explain block diagram of operational amplifier. 5

2. *(a)* Draw the equivalent circuit of operational amplifier and explain in detail. 8

(b) Explain the three open-loop op-amp configurations. 7

UNIT—II

3. *(a)* Design a summing amplifier using non-inverting configuration. 5

(b) Draw the circuit of differential amplifier and derive the expression for output voltage in it. 5

(c) For an inverting amplifier, R_l 470 , R_F 4 7 k . Assume the specifications of op-amp are

A 200,000

R_i 2 M

R_o 75

Supply voltages = 15 V

Output voltage swing = 13 V

Calculate the values of A_F, R_{iF} and R_{oF}. 5

4. *(a)* Draw block diagram of an instrumentation system. Explain instrumentation amplifier using transducer bridge. 8

(b) Explain the difference between integrator and differentiator. Give one application of each. 7

UNIT—III

5. *(a)* Define filters. Design a second-order low-pass filter at a high cut-off frequency of 1 kHz. 7

(b) Design a wide band-pass filter having with f_L 200 Hz, f_H 1 kHz and a pass band gain = 4. Draw the frequency response curve and calculate the value of Q for the filter. 8

6. *(a)* What is voltage regulator? Explain the two types of fixed voltage regulators in brief. 10

(b) Explain first-order low-pass butterworth filter. 5

UNIT—IV

7. *(a)* Draw the circuits of monostable multivibrator and obtain the expression for pulse width T. 7

(b) Explain the following : 8

(i) Frequency divider

(ii) Pulse stretcher

8. Explain the operation of 555 timer in astable mode with neat circuit and waveforms. Derive the expression for frequency of output voltage in it. 15

UNIT—V

9. *(a)* Describe the working of VCO. 7

(b) Briefly explain the functional block diagram of PLL IC 565. 8

10. *(a)* Explain the operation of PLL. 8

(b) Discuss the application of PLL as frequency synthesizer. 7

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