

TED (15) - 4042

(REVISION - 2015)

Reg. No. ....

Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

LINEAR INTEGRATED CIRCUITS

(Maximum marks : 100)

[Time : 3 hours

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define input offset voltage of an op-amp.
2. Draw the circuit diagram of a peak detector using op-amp.
3. Write the applications of Schmitt trigger circuit.
4. Write the expression for time period of astable and monostable circuits using IC 555.
5. What is the function of a voltage regulator ?

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Derive the expression for voltage gain of an inverting amplifier using op-amp.
2. Explain the working of an op-amp differentiator with the help of circuit diagram and waveform.
3. Draw and explain the first order low pass filter using op-amp.
4. Define capture range, lock-in range and pull-in time of PLL.
5. Draw the pin diagram of 555 timer and explain the function of each pin.
6. Explain the working principle of opto-coupler.
7. List the advantages and disadvantages of SMPS.

(5×6 = 30)

[P.T.O.]

PART — C  
(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) Draw and explain the block diagram of general purpose operational amplifier.  
(b) Draw the circuit diagram of an op-amp voltage follower and explain its working.

OR

- IV (a) Draw the circuit diagram of a non-inverting amplifier using op-amp and derive the expression for voltage gain.  
(b) Explain the package types available for op-amp.

UNIT — II

- V (a) Draw and explain the astable multivibrator circuit using op-amp.  
(b) Draw and explain the working of inverting summing amplifier using op-amp.

OR

- VI (a) Draw the circuit diagram of RC phase shift oscillator using op-amp and explain its working.  
(b) Draw and explain the circuit diagram of current to voltage converter using op-amp.

UNIT — III

- VII (a) With the help of a block diagram explain the working of a phase locked loop.  
(b) With the help of a circuit diagram explain how a phase locked loop can be used as FM demodulator.

OR

- VIII (a) Draw the circuit diagram and explain the working of an astable multivibrator using 555 IC.  
(b) Draw the pin configuration of NE566 VCO and explain the function of each pin.

UNIT — IV

- IX (a) Draw and explain the functional block diagram of LM 723 voltage regulator.  
(b) Explain the operation of adjustable voltage regulator LM 317.

OR

- X (a) Construct a  $\pm 9V$  dual voltage supply using suitable 78XX/79XX series regulator ICs. Explain the working of the circuit.  
(b) Draw and explain the basic low voltage regulator circuit using LM 723.