TED (15) – 4042

(REVISION — 2015)

Reg. No. .....

Signature .....

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

LINEAR INTEGRATED CIRCUITS

[*Time* : 3 hours

(Maximum marks : 100)

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)

Marks

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. 8

(b) Draw the circuit diagram of an op-amp voltage follower and explain its working. 7

Or

IV (a) Draw the circuit diagram of a non-inverting amplifier using op-amp and derive the expression for voltage gain. 8

(b) Explain the package types available for op-amp. 7

Unit — II

V (a) Draw and explain the astable multivibrator circuit using op-amp. 8

(b) Draw and explain the working of inverting summing amplifier using op-amp. 7

Or

VI (a) Draw the circuit diagram of RC phase shift oscillator using op-amp and explain its working. 8

(b) Draw and explain the circuit diagram of current to voltage converter using op-amp. 7

Unit — III

VII (a) With the help of a block diagram explain the working of a phase locked loop. 8

(b) With the help of a circuit diagram explain how a phase locked loop can be used as FM demodulator. 7

Or

VIII (a) Draw the circuit diagram and explain the working of an astable multivibrator using 555 IC. 8

(b) Draw the pin configuration of NE566 VCO and explain the function of each pin. 7

Unit — IV

IX (a) Draw and explain the functional block diagram of LM 723 voltage regulator. 8

(b) Explain the operation of adjustable voltage regulator LM 317. 7

Or

X (a) Construct a ± 9V dual voltage supply using suitable 78XX/79XX series regulator ICs. Explain the working of the circuit. 8

(b) Draw and explain the basic low voltage regulator circuit using LM 723. 7