

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2017

ANALOG 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 AC load line.
2. List any two advantages and disadvantages of crystal oscillator.
3. List any two applications of multivibrators.
4. Define rise time and tilt of a pulse waveform.
5. Define slew rate.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. Compare transformer coupled and direct coupled amplifier.
2. Explain the terms gain frequency response and bandwidth with respect to an amplifier.
3. Draw the circuit of a Colpitt's oscillator and explain its frequency of oscillation.
4. An astable multivibrator oscillates at a frequency of 100 KHz which provides a train of pulse $2\mu\text{s}$ wide. Determine the value of capacitors used if $R_{B1} = R_{B2} = 20\text{k}\Omega$.
5. With the help of circuit diagram and waveforms explain the positive biased shunt diode clipper. (Bias voltage = 4V).
6. With the help of circuit diagram and waveform explain RC differentiator.
7. Explain in brief the internal block diagram of a typical OpAmp.

(5 × 6 = 30)

PART — C

(Maximum marks : 60)

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

UNIT — I

- III (a) Describe the current shunt and current series feedback in amplifiers. 8
 (b) Derive the expression for gain of a feedback amplifier. 7

OR

- IV (a) Draw and explain the frequency response of an RC Coupled amplifier. 9
 (b) Describe the advantages of negative feedback in amplifiers. 6

UNIT — II

- V (a) Explain with circuit diagram the working of a Hartley oscillator. 8
 (b) Describe the operation of crystal oscillator. 7

OR

- VI (a) With circuit diagram and waveforms explain the working of a monostable multivibrator. 8
 (b) Describe how oscillations are generated in an LC tank circuit. 7

UNIT — III

- VII (a) Draw the circuit of an RC Integrator. State the conditions for proper integration. Plot the output when the input is a square wave. 8
 (b) Explain combinational clipper and biased clamper with waveforms. 7

OR

- VIII (a) Draw and explain various clamping circuits with waveforms. 8
 (b) With diagram explain biased positive and biased negative clipper. 7

UNIT — IV

- IX (a) Realize a circuit to obtain $V_{out} = -2V_1 + 3V_2 + 4V_3$ using an OpAmp. Use minimum value of resistance as $10k\Omega$. 8
 (b) Explain voltage follower using OpAmp. 7

OR

- X (a) Describe adder and subtractor using OpAmp. 8
 (b) Explain Schmitt trigger using OpAmp. 7