

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, APRIL-2021**

**ANALOG CIRCUITS**

[Maximum marks: 75]

(Time: 2.15 Hours)

**PART – A**

I (Answer any ***three*** questions in one or two sentences. Each question carries 2 marks)

1. List the different coupling methods in amplifiers.
2. Mention the two essential conditions satisfied by an oscillator circuit.
3. State the condition for proper differentiation.
4. Define slew rate of an OPAMP.
5. Write the function of a clamping circuit.

(3 x 2 = 6)

**PART – B**

II (Answer any ***four*** of the following questions. Each question carries 6 marks)

1. Obtain the expression for the gain of negative feedback amplifier.
2. Draw the pin diagram of IC555 timer and write any four features.
3. Define the rise time, fall time and tilt of a pulse waveform.
4. Explain the internal block schematic of OPAMP.
5. Compare the performance of different coupling methods of transistor amplifiers.
6. List the applications of LC oscillator.
7. Write the features of ideal OPAMP.

(4 x 6= 24)

**PART – C**

(Answer ***any of the three units*** from the following. Each full question carries 15 marks)

**UNIT –I**

III. (a) Define

- (1) Voltage gain (2) Current gain (3) Input impedance (4) Output impedance  
of a common emitter amplifier.

(8)

(b) Explain the working of RC coupled amplifier. (7)

**OR**

IV.(a) Explain the working of transformer coupled amplifier (8)

(b) Explain the working of emitter follower. (7)

### **UNIT-II**

V. (a) Explain the working of RC phase shift oscillator. (8)

(b) Explain the operation of Colpitt's oscillator. (7)

**OR**

VI. (a) Explain the operation of Astable Multivibrator. (10)

(b) Write any three applications of Multivibrators. (3)

(c) Define Piezoelectric effect. (2)

### **UNIT-III**

VII.(a) Explain the operation of a biased positive shunt clipper. (7)

(b) Explain the operation of an RC integrator. (8)

**OR**

VIII.(a) Explain the operation of a biased combinational clipper circuit. (8)

(b) Explain the operation of a biased positive clamper circuit. (7)

### **UNIT-IV**

IX. (a) Explain instrumentation amplifier using OPAMP. (8)

(b) Derive the expression for voltage gain of inverting amplifier. (7)

**OR**

X. (a) Explain the operation of a precision half wave rectifier using OPAMP. (7)

(b) Define the following:

(1) Input bias current (2) Input offset current (3) Input Offset voltage

(4) Common mode rejection ratio (8)

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