

Code: EC4T2, EE4T6

**II B.Tech - II Semester – Regular/Supplementary Examinations
October-2020**

**PULSE AND DIGITAL CIRCUITS
(Common for ECE, EEE)**

Duration: 3 hours

Max. Marks:70

PART – A

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22M

1.

- a) Draw the output wave of practical differentiator circuit when subjected to unit-step signal.
- b) Depict the condition when low-pass filter act as integrator.
- c) Distinguish between the terms linear and non-linear wave shaping.
- d) How bandwidth is defined in practical filter circuits.
- e) Write any two applications of clipping circuits.
- f) What do you mean by astable and bistable circuits.
- g) Indicate one practical application where Schmitt trigger is used.
- h) What are the applications of astable multivibrator?
- i) Define transmission error in time-base generators.
- j) List merits of CMOS technology.
- k) What is the advantage of the Miller integrator over Bootstrap circuit?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Analyze the step response of a RC low pass filter. 8 M

b) Prove that an RC lowpass filter behaves as a reasonably good integrator when $RC > 15T$, where T is the period of input sinusoid $V_m \sin 2\pi ft$. 8 M

3. a) Explain the operation of a negative clipper with neat sketches without considering external Battery. 8 M

b) With neat sketch, explain the working of a Two level diode clipping circuit and draw the transfer characteristics of it. 8 M

4. a) With relevant sketches, explain the operation of a Schmitt trigger circuit. 8 M

b) Design a fixed-bias bistable multivibrator with an N-P-N transistor having $h_{FE(\min)} = 100$, $V_{CC} = 20 \text{ V}$, $V_{BB} = 10 \text{ V}$, $V_{CE(\text{sat})} = 0.2 \text{ V}$, $V_{BE(\text{sat})} = 0.4 \text{ V}$ and $I_{C(\text{sat})} = 5 \text{ mA}$. 8 M

5. a) Explain the operation of a collector-coupled monostable multivibrator with neat sketches. 8 M
- b) Draw the circuit of TTL NAND gate with totem-pole output and explain its working. 8 M
6. a) Draw the circuit diagram of Bootstrap sweep generator and explain the basic principle and its operation briefly. 8 M
- b) Find the component values of a Bootstrap sweep generator, given $V_{CC}=18V$, $I_{C(sar)}=2mA$, and $h_{FE(min)} = 30$. 8 M