

Code: EC4T2, EE4T6

**II B.Tech - II Semester–Regular/Supplementary Examinations
April 2019**

**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) What is meant by linear wave shaping? Give some examples of linear wave shaping circuits.
- b) Define rise time and fall time.
- c) What is meant by clipping in wave shaping?
- d) Define Steady state response.
- e) Compare between triggering at base and collectors.
- f) Write short notes on commutating capacitors.
- g) Draw the circuit diagram of non saturating binary.
- h) List the basic and universal gates.
- i) What do you understand by the terms fan-in and fan-out?
Draw an RTL NAND Gate.
- j) List the methods of generating time-base waveforms.
- k) Define relaxation circuit. Give some examples.

PART – B

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

3 x 16 = 48 M

2. a) Three low pass RC circuits are in cascade and isolated from one another by ideal buffer amplifiers. Find the expression for the output voltage as a function of time if the input is a step voltage. 10 M
- b) Explain how High-pass RC circuit acts as differentiator. 6 M
3. a) Give the circuits of different types of shunt clippers and explain their operation with the help of their transfer characteristics. 8 M
- b) State and prove clamping circuit theorem with relevant circuit and waveforms. 8 M
4. a) Explain the phenomenon of fixed bias binary transistor circuit. 7 M
- b) Sketch the circuit diagram of Schmitt trigger and explain its operation. Define UTP and LTP. 9 M
5. a) How Astable Multivibrator can be operated? Illustrate with waveforms. 8 M

b) Design a collector coupled monostable multivibrator to obtain an output pulse of amplitude 6V and a gating time of 20 μ sec, I_c (sat) = 6 mA. The base drive required for the ON transistor is 2 times I_B (min).

Assume that V_{CE} (sat) = 0, V_{BE} (sat) = 0, h_{fe} (min) = 20 & V_{CC} = 6V. 8 M

6. a) In the boot strap circuit (shown in figure 5)

$V_{cc} = 25$ V, $V_{EE} = -15$ V, $R = 10$ K ohms,

$R_B = 150$ K ohms, $C = 0.05$ μ F, $C_1 = 100$ μ F and

$R_E = 15$ K ohms. The gating waveform has a duration of 300 μ s. The transistor parameters are $h_{ie} = 1.1$ K ohms, $h_{re} = 2.5 \times 10^{-4}$ K ohms, $h_{fe} = 50$ and $h_{oe} = 1/40$ K ohms.

- i. Draw the waveform of I_{C1} and V_o , labeling all current and voltage levels,
- ii. What is the slope error of the sweep?
- iii. What is the sweep speed and the maximum value of the sweep voltage?
- iv. What is the retrace time T_r for C to discharge completely?

Calculate the recovery time T_1 for C_1 to recharge completely. 10 M

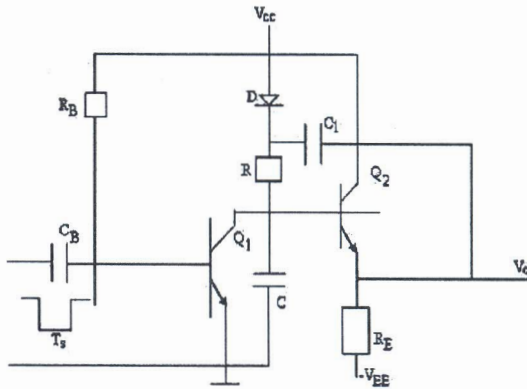


figure. 5

b) Explain the basic principles of Miller and Bootstrap time base generators.

6 M