

Code: EC4T2, EE4T6

II B.Tech - II Semester–Regular/Supplementary Examinations–April 2018

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) Differentiate between high pass and low pass RC circuits.
- b) Define rise time.
- c) State clamping theorem.
- d) Draw the basic series clipping circuit. What is the disadvantage of this circuit?
- e) What are the applications of clipping circuits?
- f) Define Hysteresis.
- g) What are the applications of Schmitt trigger?
- h) What is a multivibrator? Write any two applications of Monostable multivibrator.
- i) Define any two errors that occur in time base generators.
- j) Differentiate between DTL and TTL logic families.
- k) What is the basic principle of current time base generator?

PART – B

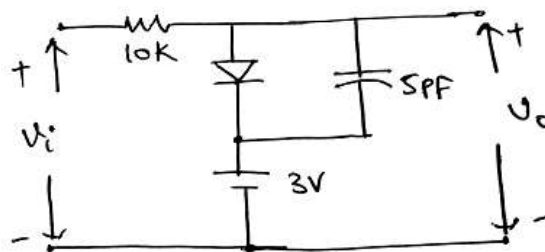
Answer any **THREE** questions. All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2. a) Derive the expression for upper cutoff frequency of a low pass RC circuit for a sinusoidal input. 6 M

b) A 1kHz symmetrical square wave of peak to peak amplitude 6V, extends $\pm 3\text{V}$ with respect to ground is applied as input to a high pass filter whose lower 3dB frequency is 500Hz. Design the circuit and sketch the output waveform. 10 M

3. a) The input voltage V_i to the clipper circuit is having 1 kHz frequency and whose voltage varies between 0 and 10V. The diode forward resistance is 100Ω and V_γ is 0.5V. Sketch the output waveforms. 8 M



b) Explain the operation of a positive peak clamping circuit with a neat sketch. 8 M

4. a) A fixed bias bistable multivibrator uses n-p-n silicon transistors with $h_{FE}=20$. The circuit parameters are $V_{CC} = 12V$, $-V_{BB} = -3V$, $R_C=1K$, R_1 (resistance between base of one transistor to collector of other transistor) is $5K$ and R_2 (resistance between base of transistor and V_{BB}) is $10K$. Calculate the stable state currents and voltages of binary. 8 M
- b) Draw the circuit diagram of Schmitt trigger circuit and explain its operation with relevant waveforms. 8 M
5. a) Derive the expression for the gate width of a collector coupled Monostable multivibrator with neat circuit diagram. 8 M
- b) Draw the circuit diagram of TTL NAND gate and explain its operation. 8 M
6. a) Explain the working principle of Bootstrap time base generator and derive the expression for its sweep speed. 8 M
- b) Explain the operation of a transistor current time base generator with suitable sketches. 8 M