

B.Tech II Year II Semester (R15) Supplementary Examinations December 2018

PULSE & DIGITAL CIRCUITS

(Electronics & Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

1 Answer the following: (10 X 02 = 20 Marks)

- (a) What is meant by linear wave shaping?
- (b) When is the high pass circuit treated as differentiator?
- (c) Design a diode clamper to restore the bottom peaks of the input signal to zero level. Use a silicon diode with $R_f=50\ \Omega$ and $R_r=400\ \text{k}\Omega$. The frequency of input voltage is 5 kHz.
- (d) Draw a circuit to transmit part of a sine wave, which is below + 6 V.
- (e) How the junctions of transistor are biased for closed switch and open switch.
- (f) Define rise time.
- (g) Why the time base generators are called sweep circuits?
- (h) What do you mean by sweep time and restoration time?
- (i) What is meant by sampling gate and give its applications?
- (j) Write the disadvantages of two diode sampling gate.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)**UNIT – I**

- 2 A square wave whose peak to peak amplitude is 4 V extends ± 2 V with respect to ground. The duration of the positive section is 0.3 s and that of the negative section is 0.1 s. If this waveform is impressed upon an RC differentiating network whose time constant is 0.3 s, what are the steady state maximum and minimum values of the output waveform?

OR

- 3 Sketch the response of low pass RC circuit for step input and derive the expression for rise time.

UNIT – II

- 4 Symmetrical 50 Hz square wave whose peak to peak excursions are ± 100 V with respect to ground is to be negatively clamped at 25 V. Draw the necessary circuit diagram and output waveform for this purpose.

OR

- 5 Explain the clamping circuit considering the source resistance and the diode forward resistance.

UNIT – III

- 6 Design a Schmitt trigger circuit for the following specifications: $UTP = 8$ V, $LTP = 5$ V, $V_{CC} = 15$ V, $I_{C(sat)} = 2$ mA, $h_{FE(min)} = 25$.

OR

- 7 Calculate the component values of a mono stable multi vibrator developing and output pulse of 500 μ s duration. Assume $h_{FE(min)} = 25$, $I_{CE(sat)} = 5$ mA, $V_{CC} = 10$ V and $V_{BB} = -4$ V.

UNIT – IV

- 8 Explain how mono stable multi vibrator is used as frequency divider.

OR

- 9 Explain the working of a transistor Bootstrap sweep circuit and derive expression for the slope sweep error.

UNIT – V

- 10 Compare the various logic families.

OR

- 11 Explain about four diode sampling gate. How pedestal can be reduced in gate circuits?