

Roll No.

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Paper ID [EC309]

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B.Tech. (Sem. - 5th)

PULSE AND DIGITAL SWITCHING CIRCUITS (EC - 309)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 × 2 = 20)

- a) Why RC circuit is preferred over RL circuit in waveshaping?
- b) What do understand by dynamic analysis of switches?
- c) List the applications of clipping circuits.
- d) Comment on gain and bandwidth considerations in wide-band amplifiers.
- e) Why is storage time eliminated in Schottky transistor?
- f) List the merits and demerits of symmetrical and unsymmetrical triggering.
- g) Differentiate between linear and non-linear wave-shaping circuits?
- h) Define various transistor switching times.
- i) Sketch the circuit of an op-amp astable multivibrator.
- j) Sketch typical input/output characteristics for a Schmitt trigger circuit.

Section - B

(4 × 5 = 20)

- Q2)** Find the output of a ringing circuit consisting of R, L and C when a step voltage is applied. What are uses of ringing circuits?
- Q3)** Describe the behavior of MOS transistor as switch.
- Q4)** Draw a circuit of a monostable multivibrator using transistors and explain its operation.
- Q5)** Sketch the circuit of a double-ended clipper using ideal p-n diodes which limit the output between ± 10 V and explain its operation.
- Q6)** What are the switching characteristics of transistor switches? Explain.

Section - C

(2 × 10 = 20)

- Q7)** Sketch the output waveforms produced by differentiating and integrating circuits in response to sine, rectangular, and triangular inputs. Discuss the distortion that can occur.
- Q8)** (a) A fixed bias binary uses npn Silicon transistors with $h_k = 20$, $V_{cc} = 12V$, $V_{bb} = 3V$, $R_c = 1K$, $R_1 = 5K$, $R_2 = 10K$. Verify that one transistor is cutoff and other transistor is in saturation. Find stable currents and voltages if $V_{ce(sat)} = 0.4V$, $V_{be(sat)} = 0.8V$.
- (b) Find the input impedance of RC differentiating circuit and compare it with that of RL differentiating circuit.
- Q9)** Write short-notes on the following:
- (a) Distributed amplifiers
- (b) Shunt compensation in wide-band amplifiers

