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.

(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