PVP 14

Code: EC4T2, EE4T6

II B.Tech - II Semester – Regular Examinations – May 2016

PULSE AND DIGITAL CIRCUITS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1.

a) Draw the low-pass RC circuit and specify for which a low-pass RC circuit behaves as integrator.
b) Write the difference between linear and non-linear wave shaping circuits.
c) Draw the circuit of a positive base clipper with output waveform for given sinusoidal input.
d) What is clamping and draw the positive clamping circuit.
e) State the clamping circuit theorem.
f) What are the different types of multivibrators?
g) Where the Schmitt trigger can be used?
h) Define the Displacement error.
i) What are the applications of timebase generators?
j) Give the comparison between TTL and ECL.
k) Draw the circuit diagram for CMOS inverter.

PART – B

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

3 x 16 = 48 M

2.

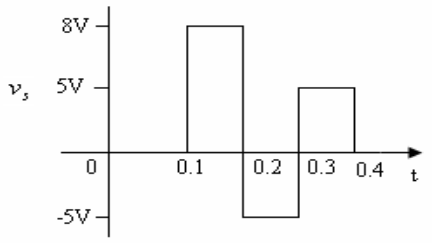
a) Show that a high-pass circuit having a time constant very much smaller than the time period of input signal behaves as differentiator. 8 M

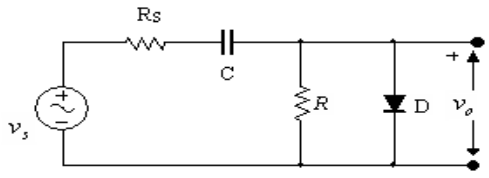
b) An ideal pulse of amplitude 10 V is fed to an RC low-pass integrator circuit. The width of pulse is 3μs. Draw the output waveforms for the following upper 3dB frequencies. a) 30 MHz b) 0.3 MHz 8 M

3.

a) Draw the circuit diagram of limiter using Zener diodes and explain its operation with the help of its transfer characteristics. 8 M

b) The input is applied to the clamping circuit shown in Fig. Plot the output waveform when $R_s = R_f = 50\Omega$, R=10K, $R_r = \infty$, C = $1\,\mu F$. 8 M





4.

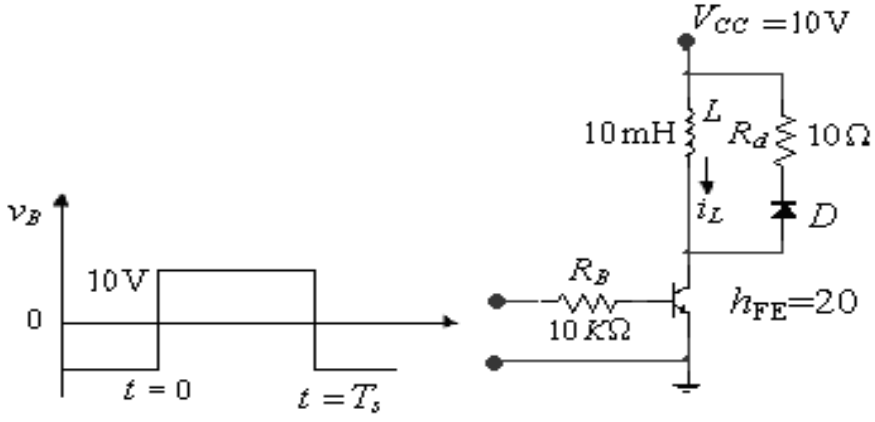
a) Draw the circuit of a voltage to time converter and obtain the expression for the time period. 8 M

b) Design a fixed-bias bistable multivibrator using *p-n-p* Ge transistors having $h_{FE(\min)} = 50$, $V_{CC} = -10V$, $V_{BB} = -10V$, $V_{CE}(sat) = -0.1$, $V_{BE}(sat) = -0.3$ and $I_C(sat) = -5mA$. 8 M

5.

a) Explain the basic principle of a bootstrap sweep generator. Draw the circuit and explain its operation. 8 M

b) For the circuit shown in Figure at $t=0$ the input waveform is applied to the base of the transistor. Calculate the time required for the inductor current to reach the maximum value. Assume that inductor is ideal and the saturation resistance of transistor is zero and $h_{FE}=20$. Calculate the time required for the inductor current to decay to 10mA. If the sum of saturation resistance and Inductive resistance is 20Ω, determine the time required for sweep, T_s, to reach its maximum value I_L. 8 M



6.

a) How the voltage controls the oscillations of astable multivibrator? Explain with neat sketches. 8 M

b) Draw the circuit of a TTL NAND gate with totem pole output and explain its working. 8 M