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Assignment Questions

Name of the Sub: PDC **Branch: II/II ECE**

UNIT I - LINEAR WAVE SHAPING

1(a) Sketch the response of low pass RC circuit for step input and derive the expression for rise time

(b) Discuss about response of high pass circuit for exponential input?

(c) A 1 KHz square wave output from an amplifier has rise time tr = 350 ns and tilt = 5 %. Determine the upper and lower 3- dB frequencies.

2 a) Prove that et = T/2RC for ramp as input to the High pass RC-Circuit?

b) Explain the working principle of rate-of-rise amplifier?

c) Explain the working of attenuator as a CRO Probe?

3 a. Discuss about RL Low pass circuit and RL High pass circuit

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

c) An ideal 2μs pulse is fed to an amplifier. Calculate and plot the output waveform when the upper 3-dB frequency is (a) 5 MHz and (b) 0.05 MHz

4. a) Explain the response of high pass circuit for square wave input.

b) 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 0.1 s and that of the negative section is 0.3 s. If this waveform is impressed upon an RC integrating network whose time constant is 0.3 s, what are the steady state maximum and minimum values of the output waveform?

5. a) Discuss about response of high pass circuit for exponential input.

b) 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 states maximum and minimum values of The output waveform?

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Assignment Questions

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UNIT III SWITCHING CHARACTERISTICS OF DEVICES

1. a) Explain the breakdown voltage consideration of a transistor.
   b) Explain about Diode forward recovery time and Diode reverse recovery time.
   c) Explain the design of transistor switch.
2. a) Explain about transistor switching times.
   b) Describe the sequence of events in an n-p-n transistor to change from cutoff to saturation and vice versa. How does temperature affect the saturation junction of a transistor?
   c) Briefly discuss the influence of breakdown voltages on the choice of supply voltage in a transistor switch.
3. a)Draw the circuit of a Schmitt trigger and give some of its applications.
   b) Design a Schmitt trigger circuit using npn silicon transistors with V_{BE} = 0.7V, V_{CE}(sat) = 0.2V, h_{fe}(min) = 60 and Ic(ON) = 3mA to meet the following specifications: V_{CC} =12V, upper threshold voltage, V_{UT} = 4V, lower threshold voltage, V_{LT} =2V.
   b) What are transpose capacitors? Explain how the commutating capacitors will increase the speed of a fixed-bias binary.
   c) Draw the circuit diagram of an astable multivibrator and obtain all the steady state voltages and currents. Show how it acts as a voltage to frequency converter.
4. a) Design a Schmitt trigger circuit for the following specification: UTP = 8 V, LTP = 5 V, VCC = 15V, IC (sat) = 2 mA, hFE(min) = 25.
   b) With neat circuit diagram, Explain the working of fixed bias bistable multi vibrator.
5. a) Derive the equation for voltage-to-frequency converter when a stable multi vibrator is used as a basic circuit.
   b) The Schmitt trigger circuit also called sinusoidal to square converter? Explain the working principle.
   c) Sketch the circuit diagram of Schmitt trigger and explain its operation.

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Assignment Questions

Name of the Sub: PDC **Branch: II/II ECE**

UNIT II NON-LINEAR WAVE SHAPING

1. a) Define i) Rise time ii) Fall time iii) Delay time iv) Storage time and Explain the factors which contribute to the delay time of transistor.
   b) Draw the circuit of CMOS NOR gate and explain its operation. Mention the advantages of CMOS over the other digital logic families.
2. a) Give the circuits of different types of shunt clippers and explain their operation with the help of their transfer characteristics
   b) State and prove clamping circuit theorem
3. a) Explain the working of a two-level diode clipper with the help of circuit diagram, waveform and transfer characteristics.
   b) Determine the output waveform for the biased clipping circuit for the square wave input.
4. a) Draw the circuit diagram and explain the working of transistor clippers.
   b) Draw the basic circuit diagram of negative peak clamper circuit and explain its operation.
   c) Give some applications of clipping & clamping circuits.
5. a) With neat circuit diagram, explain the working of an emitter coupled clipper.
   b) Explain the clamping circuit considering the source resistance and the diode Forward resistance.
6. a) Explain the working of negative clamping circuit.
   b) Design a diode clamper to restore the negative peaks of the input signal to zero level. Use a silicon diode with Rf = 50 Ω and Rr = 400 kΩ. The frequency of the input signal is 5 kHz.
7. a) Prove that external resistance $R=\sqrt{Rr \times Rf}$ in a clipping circuit?
   b) Discuss the function of series diode and shunt diode clipping circuits? How can the clipping level shifted to reference voltage? Explain?
8. a) Draw the basic circuit diagram of positive peak clamper circuit and explain its operation.
   b) Explain transfer characteristics of emitter coupled clipper and derive necessary equations

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