Code No: NR/RR210202 | **NR/RR** | **Set No. 2**

II B.Tech I Semester Examinations,November 2010
PULSE AND DIGITAL CIRCUITS
Common to Electronics And Computer Engineering, Electronics And
Telematics, Electronics And Communication Engineering, Electrical And
Electronics Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Give the circuits of series clipper circuits and explain their operation with the help of transfer characteristics. [8]

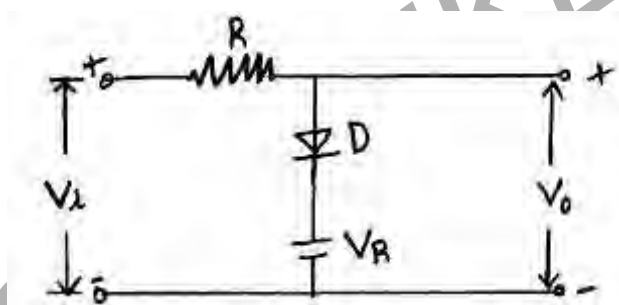   (b) For the circuit shown in the figure 8b : sketch the input and output waveforms if R = 1 KΩ [8]

Figure 8b

V_R = 10 V, V_i = 20 Sin ωt
R_f = 100 Ω R_r =∝
V_γ = 0

2. (a) Distinguish between logic gate and sampling gate. [4]

   (b) Why is a sampling referred as a linear gate? [4]

   (c) Illustrate the principle of operation of a linear gate using series switch and shunt switch. What are the disadvantages? [8]

3. Design a Schmitt trigger circuit using n-p-n silicon transistors to meet the following specifications:

   V_{cc}=12v, UTP=4v, LTP=2v, h_{fe}=60, I_{c2}=3mA.

   Use relevant assumptions and the empirical relationships. [16]

4. (a) Define the terms:
      i. Slope or sweep speed error and [6]
      ii. Displacement error

   (b) An exponential sweep results when a capacitor is charged from a supply voltage V through a resistor R. If the peak sweep voltage is V_s , derive an expression for slope error (es). [10]

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Set No. 2

5. (a) Explain the behavior of a BJT as a switch. Give Applications. [8]

   (b) Write a short note on switching times of a transistor. [8]

6. (a) Draw the block diagram and waveforms for a divider without phase jitter. [8]

   (b) Frequency division of 6:1 is obtained with an astable multivibrator negative pulses are applied to both bases of the n-p-n transistors. The OFF time of Q_1 is twice that of Q_2. Sketch the wave shapes at B_1 and B_2 , showing superimposed pulses. [8]

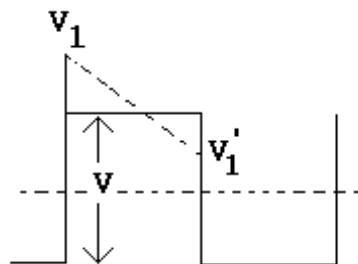7. (a) Verify $V_1 = \frac{V}{1+e^{-T/2RC}}$ $V_1' = \frac{V}{1+e^{T/2RC}}$ (figure1a)

Figure 1a

For a symmetrical square wave applied to a high pass RC circuit.

   (b) Draw the RC high pass circuit and explain its working with step voltage input. [10+6]

8. (a) Compare the diode controlled and RC controlled astable operated blocking oscillator. [6]

   (b) What are the advantages of RC controlled oscillator? [4]

   (c) List the applications of blocking oscillators. [6]

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Code No: NR/RR210202 $\boxed{\textbf{NR/RR}}$ $\boxed{\textbf{Set No. 4}}$

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Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
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1. (a) Give the circuits of series clipper circuits and explain their operation with the help of transfer characteristics.   [8]

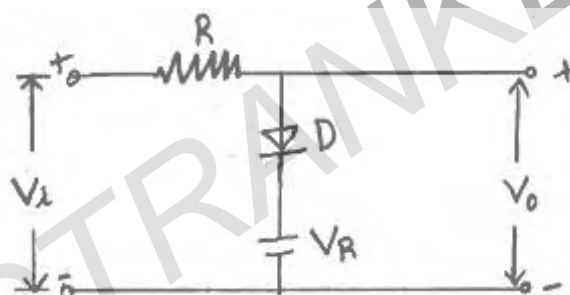   (b) For the circuit shown in the figure 8b : sketch the input and output waveforms if R = 1 KΩ   [8]

Figure 8b

$V_R = 10$ V, $V_i = 20 \sin \omega t$
$R_f = 100 \ \Omega$ $R_r = \propto$
$V_\gamma = 0$

2. (a) Compare the diode controlled and RC controlled astable operated blocking oscillator.   [6]

   (b) What are the advantages of RC controlled oscillator?   [4]

   (c) List the applications of blocking oscillators.   [6]

3. (a) Draw the block diagram and waveforms for a divider without phase jitter. [8]

   (b) Frequency division of 6:1 is obtained with an astable multivibrator negative pulses are applied to both bases of the n-p-n transistors. The OFF time of Q_1 is twice that of Q_2. Sketch the wave shapes at B_1 and B_2 , showing superimposed pulses.   [8]

4. Design a Schmitt trigger circuit using n-p-n silicon transistors to meet the following specifications:

   V_{cc}=12v, UTP=4v, LTP=2v, h_{fe}=60, I_{c2}=3mA.

   Use relevant assumptions and the empirical relationships.   [16]

5. (a) Define the terms:

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$$\boxed{\text{NR/RR}}$$ $$\boxed{\text{Set No. } 4}$$

      i. Slope or sweep speed error and   [6]

      ii. Displacement error

(b) An exponential sweep results when a capacitor is charged from a supply voltage V through a resistor R. If the peak sweep voltage is V_s , derive an expression for slope error (es).   [10]

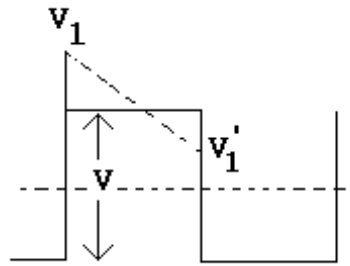6.   (a) Verify $V_1 = \frac{V}{1+e^{-T/2RC}}$ $V_1' = \frac{V}{1+e^{T/2RC}}$ (figure1a)

Figure 1a

For a symmetrical square wave applied to a high pass RC circuit.

(b) Draw the RC high pass circuit and explain its working with step voltage input.
                                              [10+6]

7.   (a) Distinguish between logic gate and sampling gate.   [4]

    (b) Why is a sampling referred as a linear gate?   [4]

    (c) Illustrate the principle of operation of a linear gate using series switch and shunt switch. What are the disadvantages?   [8]

8.   (a) Explain the behavior of a BJT as a switch. Give Applications.   [8]

    (b) Write a short note on switching times of a transistor.   [8]

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Code No: NR/RR210202 | NR/RR | Set No. 1

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Time: 3 hours   Max Marks: 80
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1. (a) Compare the diode controlled and RC controlled astable operated blocking oscillator. [6]

   (b) What are the advantages of RC controlled oscillator? [4]

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   Use relevant assumptions and the empirical relationships. [16]

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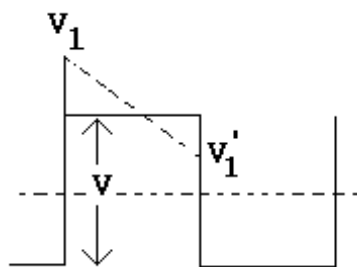

Figure 1a
For a symmetrical square wave applied to a high pass RC circuit.

   (b) Draw the RC high pass circuit and explain its working with step voltage input.
   [10+6]

5. (a) Explain the behavior of a BJT as a switch. Give Applications. [8]

   (b) Write a short note on switching times of a transistor. [8]

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Set No. 1

6. (a) Draw the block diagram and waveforms for a divider without phase jitter. [8]

   (b) Frequency division of 6:1 is obtained with an astable multivibrator negative pulses are applied to both bases of the n-p-n transistors. The OFF time of Q_1 is twice that of Q_2. Sketch the wave shapes at B_1 and B_2 , showing superimposed pulses. [8]

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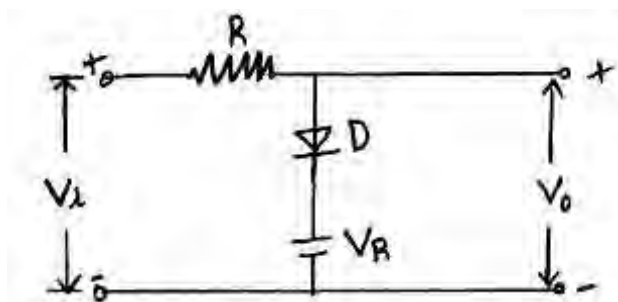   (b) For the circuit shown in the figure 8b : sketch the input and output waveforms if R = 1 KΩ [8]

Figure 8b

$V_R = 10$ V, $V_i = 20$ Sin ωt
$R_f = 100$ Ω $R_r = \infty$
$V_\gamma = 0$

8. (a) Distinguish between logic gate and sampling gate. [4]

   (b) Why is a sampling referred as a linear gate? [4]

   (c) Illustrate the principle of operation of a linear gate using series switch and shunt switch. What are the disadvantages? [8]

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Code No: NR/RR210202   **NR/RR**   **Set No. 3**

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Electronics Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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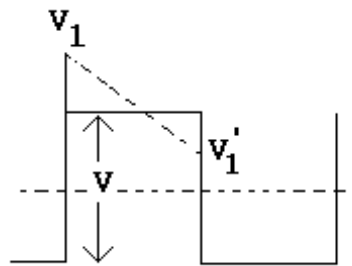1. (a) Verify $V_1 = \frac{V}{1+e^{-T/2RC}}$ $V_1' = \frac{V}{1+e^{T/2RC}}$ (figure1a)

Figure 1a

For a symmetrical square wave applied to a high pass RC circuit.

   (b) Draw the RC high pass circuit and explain its working with step voltage input.
   [10+6]

2. (a) Distinguish between logic gate and sampling gate. [4]

   (b) Why is a sampling referred as a linear gate? [4]

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   (b) What are the advantages of RC controlled oscillator? [4]

   (c) List the applications of blocking oscillators. [6]

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6. (a) Define the terms:

    i. Slope or sweep speed error and   [6]

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  (b) An exponential sweep results when a capacitor is charged from a supply voltage V through a resistor R. If the peak sweep voltage is V_s , derive an expression for slope error (es).   [10]

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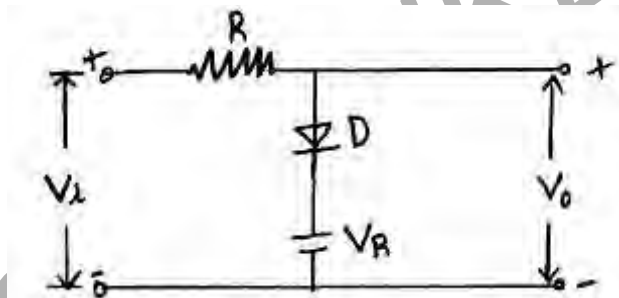 (b) For the circuit shown in the figure 8b : sketch the input and output waveforms if R = 1 KΩ   [8]

Figure 8b

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$R_f = 100$ Ω $R_r = \infty$

$V_\gamma = 0$

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