Code No: RR311001 $\boxed{\textbf{RR}}$ $\boxed{\textbf{Set No. 2}}$

III B.Tech I Semester Examinations,November 2010
LINEAR AND DIGITAL IC APPLICATIONS
Common to BME, MECT, ETM, E.CONT.E, EIE

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Explain in detail the following terms with reference to PLL
    i. Lock range
    ii. Capture range
    iii. Capture transient
    iv. Pull-in-time.   [8]
   (b) i. Draw the internal functional diagram of NE 566 VCO and derive expression for free running frequency.
       ii. From the given component values find the free running frequency Control voltage $V_C = 10.9V$, $V_{CC} = 12V$, R_1=4.7k and C_1=1.1nF.

[8]

2. (a) Define the terms   [4]
    i. Positive logic
    ii. Negative logic
   (b) Show that positive logic EX-OR operation is equivalent to nagative logic EX-NOR operation .   [4]
   (c) Draw the circuit 3 input D.T.L. NAND gate and explain its operation with the help of truth-table. How can you improve the Fan-out of the corcuit. Explain with the help of modified circuit.   [8]

3. (a) Explain the operation of a delay equalizer circuit with neat sketches. Derive an expression relating input and output voltages of the equalizer.   [8+2]
   (b) For the all pass filter, determine the phase shift between input and output at f=2 kHz. To obtain a positive phase shift. What modifications are necessary in the circuit?   [6]

4. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback?   [8]
   (b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation.   [8]

5. (a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer.

[10]

   (b) Design a Monostable multivibrator using 555 timer to produce a pulse width of 100 m sec.   [6]

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6. (a) List and explain the two special cases of inverting amplifiers. [6]

   (b) What is a voltage follower? What are its features and applications? [4]

   (c) Derive the expression for the output voltage of a non inverting amplifier [6]

7. (a) Compare different A/D converters for their merits and demerits. [8]

   (b) Give the schematic circuit diagram of a successive approximation type A/D converter and explain the operations of this system. [8]

8. (a) What is an OP-AMP? Why it is called so? [4]

   (b) Explain the parameters that should be considered for ac and dc applications of an OP-AMP [5]

   (c) Draw and explain the three open loop OP-AMP configurations with neat circuit diagram [7]

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Code No: RR311001　　　　　　**RR**　　　　**Set No. 4**

III B.Tech I Semester Examinations,November 2010
LINEAR AND DIGITAL IC APPLICATIONS
Common to BME, MECT, ETM, E.CONT.E, EIE

Time: 3 hours　　　　　　　　　　　　　　　　　Max Marks: 80

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

1. (a) Explain in detail the following terms with reference to PLL

   i. Lock range
   ii. Capture range
   iii. Capture transient
   iv. Pull-in-time.　　　　　　　　　　　　　　　　　　　　　[8]

   (b) i. Draw the internal functional diagram of NE 566 VCO and derive expression for free running frequency.

   ii. From the given component values find the free running frequency Control voltage $V_C = 10.9V$, $V_{CC} = 12V$, R_1=4.7k and C_1=1.1nF.

   　　　　　　　　　　　　　　　　　　　　　　　　　　　[8]

2. (a) List and explain the two special cases of inverting amplifiers.　　[6]

   (b) What is a voltage follower? What are its features and applications?　[4]

   (c) Derive the expression for the output voltage of a non inverting amplifier　[6]

3. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback?　　　　　　　　　　　　　　　　　　　[8]

   (b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation.　　　　　　　　　　　　　　　　　　　　　　　[8]

4. (a) Define the terms　　　　　　　　　　　　　　　　　　　　[4]

   i. Positive logic
   ii. Negative logic

   (b) Show that positive logic EX-OR operation is equivalent to nagative logic EX-NOR operation .　　　　　　　　　　　　　　　　　　　　[4]

   (c) Draw the circuit 3 input D.T.L. NAND gate and explain its operation with the help of truth-table. How can you improve the Fan-out of the corcuit. Explain with the help of modified circuit.　　　　　　　　　　　　　　[8]

5. (a) What is an OP-AMP? Why it is called so?　　　　　　　　　　[4]

   (b) Explain the parameters that should be considered for ac and dc applications of an OP-AMP　　　　　　　　　　　　　　　　　　　　[5]

   (c) Draw and explain the three open loop OP-AMP configurations with neat circuit diagram　　　　　　　　　　　　　　　　　　　　　[7]

3

6. (a) Explain the operation of a delay equalizer circuit with neat sketches. Derive an expression relating input and output voltages of the equalizer.   [8+2]

   (b) For the all pass filter, determine the phase shift between input and output at f=2 kHz. To obtain a positive phase shift. What modifications are necessary in the circuit?   [6]

7. (a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer.   [10]

   (b) Design a Monostable multivibrator using 555 timer to produce a pulse width of 100 m sec.   [6]

8. (a) Compare different A/D converters for their merits and demerits.   [8]

   (b) Give the schematic circuit diagram of a successive approximation type A/D converter and explain the operations of this system.   [8]

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Code No: RR311001 $\boxed{\textbf{RR}}$ $\boxed{\textbf{Set No. 1}}$

III B.Tech I Semester Examinations,November 2010
LINEAR AND DIGITAL IC APPLICATIONS
Common to BME, MECT, ETM, E.CONT.E, EIE

Time: 3 hours   Max Marks: 80

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

1. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback? [8]

    (b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation. [8]

2. (a) What is an OP-AMP? Why it is called so? [4]

    (b) Explain the parameters that should be considered for ac and dc applications of an OP-AMP [5]

    (c) Draw and explain the three open loop OP-AMP configurations with neat circuit diagram [7]

3. (a) Define the terms [4]
        i. Positive logic
        ii. Negative logic

    (b) Show that positive logic EX-OR operation is equivalent to nagative logic EX-NOR operation . [4]

    (c) Draw the circuit 3 input D.T.L. NAND gate and explain its operation with the help of truth-table. How can you improve the Fan-out of the corcuit. Explain with the help of modified circuit. [8]

4. (a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer. [10]

    (b) Design a Monostable multivibrator using 555 timer to produce a pulse width of 100 m sec. [6]

5. (a) Explain the operation of a delay equalizer circuit with neat sketches. Derive an expression relating input and output voltages of the equalizer. [8+2]

    (b) For the all pass filter, determine the phase shift between input and output at f=2 kHz. To obtain a positive phase shift. What modifications are necessary in the circuit? [6]

6. (a) List and explain the two special cases of inverting amplifiers. [6]

    (b) What is a voltage follower? What are its features and applications? [4]

    (c) Derive the expression for the output voltage of a non inverting amplifier [6]

5

7. (a) Compare different A/D converters for their merits and demerits.   [8]

   (b) Give the schematic circuit diagram of a successive approximation type A/D converter and explain the operations of this system.   [8]

8. (a) Explain in detail the following terms with reference to PLL

     i. Lock range

     ii. Capture range

     iii. Capture transient

     iv. Pull-in-time.   [8]

   (b)   i. Draw the internal functional diagram of NE 566 VCO and derive expression for free running frequency.

     ii. From the given component values find the free running frequency Control voltage $V_C = 10.9V$, $V_{CC} = 12V$, R_1=4.7k and C_1=1.1nF.

     [8]

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| RR | Set No. 3 |

III B.Tech I Semester Examinations,November 2010
LINEAR AND DIGITAL IC APPLICATIONS
Common to BME, MECT, ETM, E.CONT.E, EIE

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) What is an OP-AMP? Why it is called so?   [4]

   (b) Explain the parameters that should be considered for ac and dc applications of an OP-AMP   [5]

   (c) Draw and explain the three open loop OP-AMP configurations with neat circuit diagram   [7]

2. (a) List and explain the two special cases of inverting amplifiers.   [6]

   (b) What is a voltage follower? What are its features and applications?   [4]

   (c) Derive the expression for the output voltage of a non inverting amplifier   [6]

3. (a) Compare different A/D converters for their merits and demerits.   [8]

   (b) Give the schematic circuit diagram of a successive approximation type A/D converter and explain the operations of this system.   [8]

4. (a) Explain the operation of a delay equalizer circuit with neat sketches. Derive an expression relating input and output voltages of the equalizer.   [8+2]

   (b) For the all pass filter, determine the phase shift between input and output at f=2 kHz. To obtain a positive phase shift. What modifications are necessary in the circuit?   [6]

5. (a) Define the terms   [4]
      i. Positive logic
      ii. Negative logic

   (b) Show that positive logic EX-OR operation is equivalent to nagative logic EX-NOR operation .   [4]

   (c) Draw the circuit 3 input D.T.L. NAND gate and explain its operation with the help of truth-table. How can you improve the Fan-out of the corcuit. Explain with the help of modified circuit.   [8]

6. (a) What feedback is preferred for oscillators and why? What is the effect of negative feedback?   [8]

   (b) Design an OP-AMP based relaxation oscillator and derive the frequency of oscillation.   [8]

7. (a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer.
                                                                                [10]

7

(b) Design a Monostable multivibrator using 555 timer to produce a pulse width of 100 m sec. [6]

8. (a) Explain in detail the following terms with reference to PLL

    i. Lock range

    ii. Capture range

    iii. Capture transient

    iv. Pull-in-time. [8]

(b)   i. Draw the internal functional diagram of NE 566 VCO and derive expression for free running frequency.

    ii. From the given component values find the free running frequency Control voltage $V_C = 10.9V$, $V_{CC} = 12V$, $R_1=4.7k$ and $C_1=1.1nF$.

[8]

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