Code No: R05321404 **R05** **Set No. 2**

III B.Tech II Semester Examinations,December 2010
LINEAR AND DIGITAL IC APPLICATIONS
Mechatronics

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Draw an integrator circuit and explain its operation. Discuss the frequency response for a practical integrator.
   (b) Explain how an Op-amp can be used as summing amplifier? Draw the diagram of a four input summer.
   (c) Explain the operation of a scale changer with circuit diagram. [6+6+4]
2. (a) What is the necessity of tri state buffer?
   (b) Design a 16-bit comparator using 74×85 ICs? [8+8]
3. (a) Design a conversion circuit to convert a T flip-flop to D flip-flop?
   (b) Explain the operation of parallel in parallel out shift register? [8+8]
4. (a) Discuss the electrical characteristics of an Op-amp in detail.
   (b) Draw an ideal voltage transfer curve of an Op-amp.
   (c) What are the features of IC 741? [10+3+3]
5. (a) A counting type ADC uses a 8bit DAC. The MSB of DAC output voltage is +5V
      i. If the analog I/P voltage is +6.85 V, what will be the R-2R ladder o/p voltage when the clock stops?
      ii. What is the no.of clock pulses that occur between the release of reset and stopping of the clock?
   (b) Calculate the values of the LSB, MSB at full scale output for an 8 bit DAC for the 0 to 10 V range. [10+6]
6. (a) Design a triangular wave generator using a comparator block and an integrator block to oscillate at 4KHz and Vo(P-P)=7 V use an Op-amp with ±15 volt power supplies. Make necessary assumptions.
   (b) What is the purpose of back to back set of two zener diodes?
   (c) What is the main advantage of comparator based triangular wave generator over free running astable multivibrator based circuit? [8+4+4]
7. (a) Discuss interfacing of logic families with examples.
   (b) Explain sinking current and sourcing current of TTL output? Which of the above parameters decide the fan out and how? [8+8]

8. (a) Describe how frequency division and multiplication can be achieved using a Phase Locked Loop.

   (b) Draw the circuit of a PLL AM detector and explain its operation. [12+4]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05321404 **R05** **Set No. 4**

III B.Tech II Semester Examinations,December 2010
LINEAR AND DIGITAL IC APPLICATIONS
Mechatronics

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) What is the necessity of tri state buffer?
   (b) Design a 16-bit comparator using 74×85 ICs? [8+8]
2. (a) Discuss the electrical characteristics of an Op-amp in detail.
   (b) Draw an ideal voltage transfer curve of an Op-amp.
   (c) What are the features of IC 741? [10+3+3]
3. (a) A counting type ADC uses a 8bit DAC. The MSB of DAC output voltage is +5V
      i. If the analog I/P voltage is +6.85 V, what will be the R-2R ladder o/p voltage when the clock stops?
      ii. What is the no.of clock pulses that occur between the release of reset and stopping of the clock?
   (b) Calculate the values of the LSB, MSB at full scale output for an 8 bit DAC for the 0 to 10 V range. [10+6]
4. (a) Design a conversion circuit to convert a T flip-flop to D flip-flop?
   (b) Explain the operation of parallel in parallel out shift register? [8+8]
5. (a) Describe how frequency division and multiplication can be achieved using a Phase Locked Loop.
   (b) Draw the circuit of a PLL AM detector and explain its operation. [12+4]
6. (a) Discuss interfacing of logic families with examples.
   (b) Explain sinking current and sourcing current of TTL output? Which of the above parameters decide the fan out and how? [8+8]
7. (a) Draw an integrator circuit and explain its operation. Discuss the frequency response for a practical integrator.
   (b) Explain how an Op-amp can be used as summing amplifier? Draw the diagram of a four input summer.
   (c) Explain the operation of a scale changer with circuit diagram. [6+6+4]
8. (a) Design a triangular wave generator using a comparator block and an integrator block to oscillate at 4KHz and Vo(P-P)=7 V use an Op-amp with ±15 volt power supplies. Make necessary assumptions.

(b) What is the purpose of back to back set of two zener diodes?

(c) What is the main advantage of comparator based triangular wave generator over free running astable multivibrator based circuit? [8+4+4]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05321404 **R05** **Set No. 1**

III B.Tech II Semester Examinations,December 2010
LINEAR AND DIGITAL IC APPLICATIONS
Mechatronics

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Design a triangular wave generator using a comparator block and an integrator block to oscillate at 4KHz and Vo(P-P)=7 V use an Op-amp with ±15 volt power supplies. Make necessary assumptions.
   (b) What is the purpose of back to back set of two zener diodes?
   (c) What is the main advantage of comparator based triangular wave generator over free running astable multivibrator based circuit? [8+4+4]
2. (a) What is the necessity of tri state buffer?
   (b) Design a 16-bit comparator using 74×85 ICs? [8+8]
3. (a) Discuss the electrical characteristics of an Op-amp in detail.
   (b) Draw an ideal voltage transfer curve of an Op-amp.
   (c) What are the features of IC 741? [10+3+3]
4. (a) Draw an integrator circuit and explain its operation. Discuss the frequency response for a practical integrator.
   (b) Explain how an Op-amp can be used as summing amplifier? Draw the diagram of a four input summer.
   (c) Explain the operation of a scale changer with circuit diagram. [6+6+4]
5. (a) Discuss interfacing of logic families with examples.
   (b) Explain sinking current and sourcing current of TTL output? Which of the above parameters decide the fan out and how? [8+8]
6. (a) Design a conversion circuit to convert a T flip-flop to D flip-flop?
   (b) Explain the operation of parallel in parallel out shift register? [8+8]
7. (a) A counting type ADC uses a 8bit DAC. The MSB of DAC output voltage is +5V
      i. If the analog I/P voltage is +6.85 V, what will be the R-2R ladder o/p voltage when the clock stops?
      ii. What is the no.of clock pulses that occur between the release of reset and stopping of the clock?
   (b) Calculate the values of the LSB, MSB at full scale output for an 8 bit DAC for the 0 to 10 V range. [10+6]

8. (a) Describe how frequency division and multiplication can be achieved using a Phase Locked Loop.
   (b) Draw the circuit of a PLL AM detector and explain its operation. [12+4]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05321404 **R05** **Set No. 3**

III B.Tech II Semester Examinations,December 2010
LINEAR AND DIGITAL IC APPLICATIONS
Mechatronics

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Design a conversion circuit to convert a T flip-flop to D flip-flop?
   (b) Explain the operation of parallel in parallel out shift register? [8+8]
2. (a) A counting type ADC uses a 8bit DAC. The MSB of DAC output voltage is +5V
      i. If the analog I/P voltage is +6.85 V, what will be the R-2R ladder o/p voltage when the clock stops?
      ii. What is the no.of clock pulses that occur between the release of reset and stopping of the clock?
   (b) Calculate the values of the LSB, MSB at full scale output for an 8 bit DAC for the 0 to 10 V range. [10+6]
3. (a) Describe how frequency division and multiplication can be achieved using a Phase Locked Loop.
   (b) Draw the circuit of a PLL AM detector and explain its operation. [12+4]
4. (a) Design a triangular wave generator using a comparator block and an integrator block to oscillate at 4KHz and Vo(P-P)=7 V use an Op-amp with ±15 volt power supplies. Make necessary assumptions.
   (b) What is the purpose of back to back set of two zener diodes?
   (c) What is the main advantage of comparator based triangular wave generator over free running astable multivibrator based circuit? [8+4+4]
5. (a) Discuss interfacing of logic families with examples.
   (b) Explain sinking current and sourcing current of TTL output? Which of the above parameters decide the fan out and how? [8+8]
6. (a) Draw an integrator circuit and explain its operation. Discuss the frequency response for a practical integrator.
   (b) Explain how an Op-amp can be used as summing amplifier? Draw the diagram of a four input summer.
   (c) Explain the operation of a scale changer with circuit diagram. [6+6+4]
7. (a) Discuss the electrical characteristics of an Op-amp in detail.
   (b) Draw an ideal voltage transfer curve of an Op-amp.
   (c) What are the features of IC 741? [10+3+3]

Code No: R05321404 **R05** **Set No. 3**

8. (a) What is the necessity of tri state buffer?
   (b) Design a 16-bit comparator using 74×85 ICs? [8+8]

⋆ ⋆ ⋆ ⋆ ⋆