Code No: 07A41001 **R07** **Set No. 2**

II B.Tech II Semester Examinations,April/May 2012
SENSORS AND SIGNAL CONDITIONING
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. What are the spectral features of capacitive transducers which make them attractive for certain applications? Prove that in the case of feedback type capacitive transducer the output voltage is directly proportional to displacement. [16]

2. Determine the output voltage and current respectively for 1% change in input resistance of voltage and current sensitive equal arm bridges respectively having a resistance of 100 Ω in each arm initially. The supply voltage is 6V and the resistance of the galvanometer is 200 Ω. [16]

3. A semiconductor strain gauge having a resistance of 1000 Ω and gauge factor of 133 is subjected to a compressive strain of 500 microstrain. calculate new resistance of the gauge. [16]

4. Explain the difference between the limiting, and known errors by giving suitable examples. [16]

5. (a) Explain the working and construction details of electrochemical sensors.
   (b) Also write the applications of it. [16]

6. The circuit in figure 5 is the signal conditioner for a capacitive level sensor that has C_{min}= 41.46PF, C_{max}= 87.07PF & sensitivity 0.19PF/L. Design the circuit components to obtain a frequency independent voltage that is 0V for the empty tank and 1V for the full tank. [16]

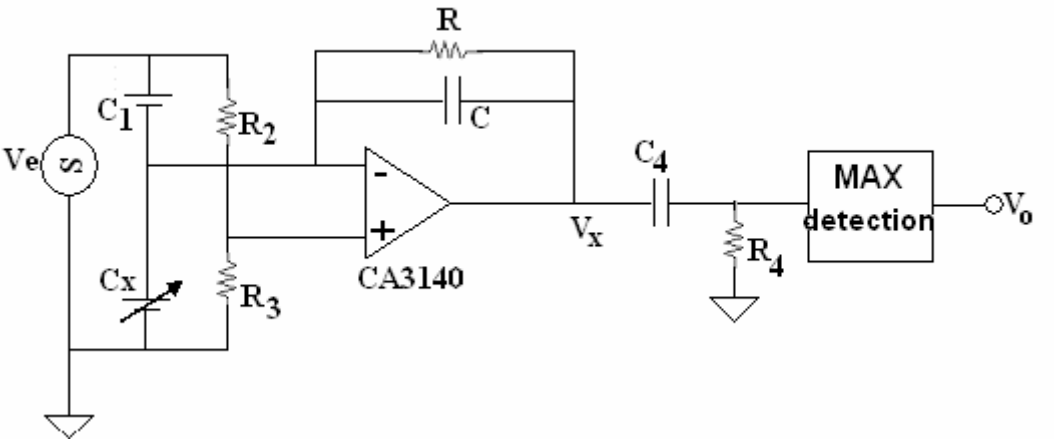

Figure 5

7. (a) Write principle and operation of Incremental position encoder

(b) Write its applications in industry [10+6]

8. a) Explain the noise sources in amplifiers with relevant equation.
   b) Write the methods for measuring small currents using an electrometer amplifier. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: 07A41001 **R07** **Set No. 4**

II B.Tech II Semester Examinations,April/May 2012
SENSORS AND SIGNAL CONDITIONING
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1.a) Explain the noise sources in amplifiers with relevant equation.
b) Write the methods for measuring small currents using an electrometer amplifier. [8+8]

2. Determine the output voltage and current respectively for 1% change in input resistance of voltage and current sensitive equal arm bridges respectively having a resistance of 100 Ω in each arm initially. The supply voltage is 6V and the resistance of the galvanometer is 200 Ω. [16]

3. What are the spectral features of capacitive transducers which make them attractive for certain applications? Prove that in the case of feedback type capacitive transducer the output voltage is directly proportional to displacement. [16]

4. A semiconductor strain gauge having a resistance of 1000 Ω and gauge factor of 133 is subjected to a compressive strain of 500 microstrain. calculate new resistance of the gauge. [16]

5. (a) Write principle and operation of Incremental position encoder
(b) Write its applications in industry [10+6]

6. Explain the difference between the limiting, and known errors by giving suitable examples. [16]

7. The circuit in figure 5 is the signal conditioner for a capacitive level sensor that has C_{min}= 41.46PF, C_{max}= 87.07PF & sensitivity 0.19PF/L. Design the circuit components to obtain a frequency independent voltage that is 0V for the empty tank and 1V for the full tank. [16]

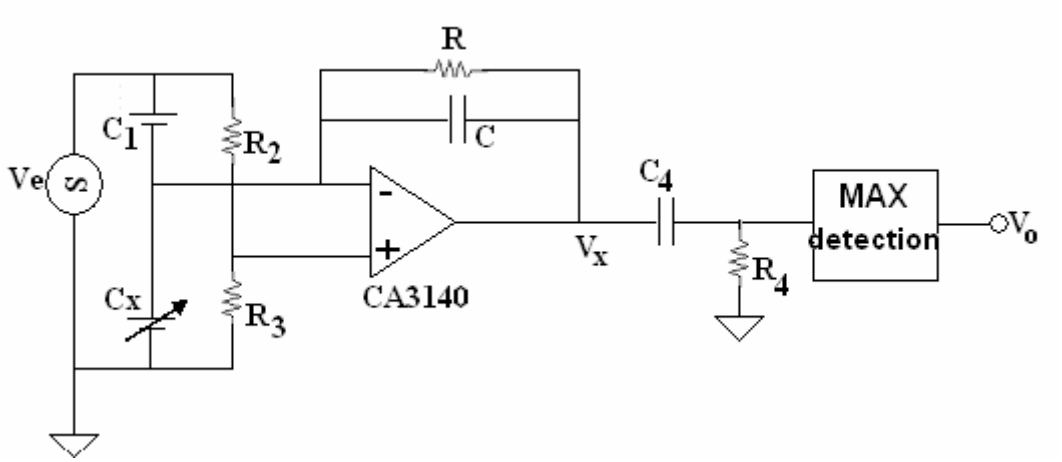

Figure 5

8. (a) Explain the working and construction details of electrochemical sensors.
   (b) Also write the applications of it. [16]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: 07A41001 **R07** **Set No. 1**

II B.Tech II Semester Examinations,April/May 2012
SENSORS AND SIGNAL CONDITIONING
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Explain the difference between the limiting, and known errors by giving suitable examples. [16]

2. Determine the output voltage and current respectively for 1% change in input resistance of voltage and current sensitive equal arm bridges respectively having a resistance of 100 Ω in each arm initially. The supply voltage is 6V and the resistance of the galvanometer is 200 Ω. [16]

3. The circuit in figure 5 is the signal conditioner for a capacitive level sensor that has C_{min}= 41.46PF, C_{max}= 87.07PF & sensitivity 0.19PF/L. Design the circuit components to obtain a frequency independent voltage that is 0V for the empty tank and 1V for the full tank. [16]

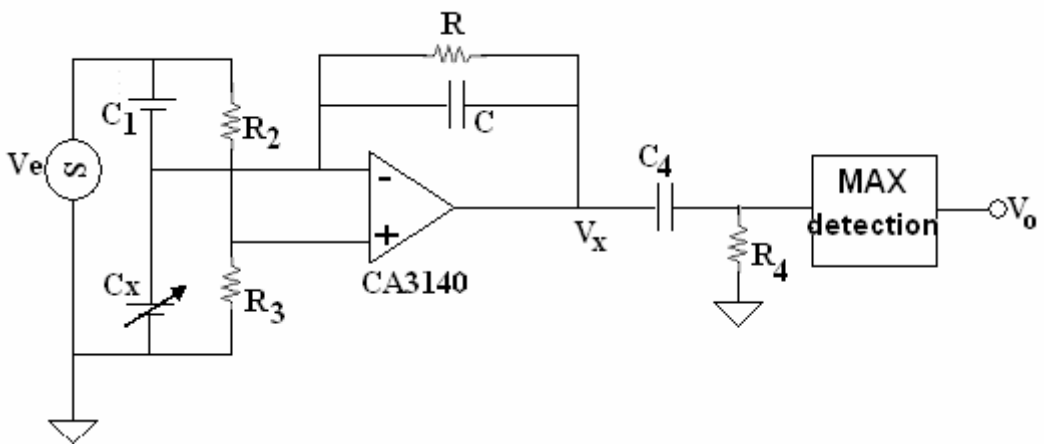

Figure 5

4. (a) Explain the working and construction details of electrochemical sensors.
   (b) Also write the applications of it. [16]

5. a) Explain the noise sources in amplifiers with relevant equation.
   b) Write the methods for measuring small currents using an electrometer amplifier. [8+8]

6. (a) Write principle and operation of Incremental position encoder
   (b) Write its applications in industry [10+6]

7. A semiconductor strain gauge having a resistance of 1000 Ω and gauge factor of 133 is subjected to a compressive strain of 500 microstrain. calculate new resistance of the gauge. [16]

8. What are the spectral features of capacitive transducers which make them attractive for certain applications? Prove that in the case of feedback type capacitive transducer the output voltage is directly proportional to displacement. [16]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: 07A41001 **R07** **Set No. 3**

II B.Tech II Semester Examinations,April/May 2012
SENSORS AND SIGNAL CONDITIONING
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Write principle and operation of Incremental position encoder
   (b) Write its applications in industry [10+6]

2. Determine the output voltage and current respectively for 1% change in input resistance of voltage and current sensitive equal arm bridges respectively having a resistance of 100 Ω in each arm initially. The supply voltage is 6V and the resistance of the galvanometer is 200 Ω. [16]

3. Explain the difference between the limiting, and known errors by giving suitable examples. [16]

4. (a) Explain the working and construction details of electrochemical sensors.
   (b) Also write the applications of it. [16]

5. The circuit in figure 5 is the signal conditioner for a capacitive level sensor that has C_{min}= 41.46PF, C_{max}= 87.07PF & sensitivity 0.19PF/L. Design the circuit components to obtain a frequency independent voltage that is 0V for the empty tank and 1V for the full tank. [16]

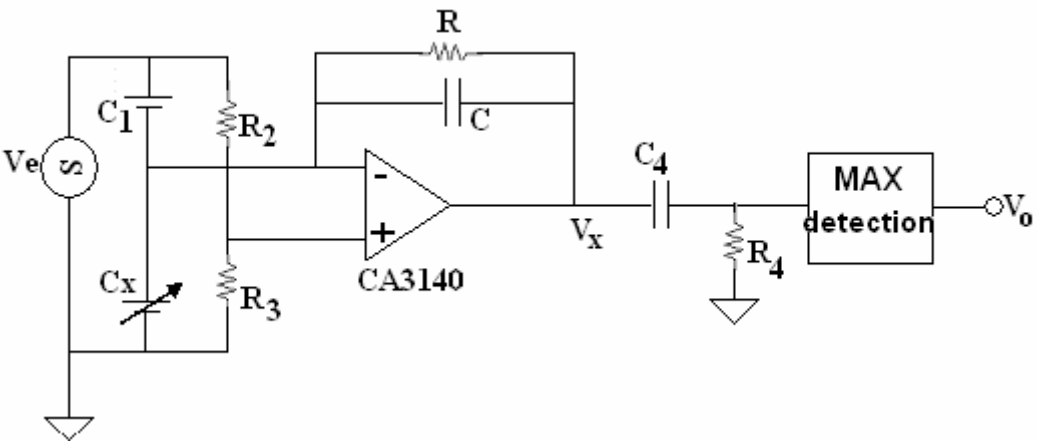

Figure 5

6. What are the spectral features of capacitive transducers which make them attractive for certain applications? Prove that in the case of feedback type capacitive transducer the output voltage is directly proportional to displacement. [16]

7.a) Explain the noise sources in amplifiers with relevant equation.
b) Write the methods for measuring small currents using an electrometer amplifier. [8+8]

8. A semiconductor strain gauge having a resistance of 1000 Ω and gauge factor of 133 is subjected to a compressive strain of 500 microstrain. calculate new resistance of the gauge. [16]

⋆ ⋆ ⋆ ⋆ ⋆