Code No: 07A31002 **R07** **Set No. 2**

II B.Tech I Semester Examinations,MAY 2011
SENSORS AND SIGNAL CONDITIONING
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the operation of Charge amplifier.
   (b) How the frequency response limitation of Chopper amplifier is overcome.[8+8]

2. (a) Define the terms
      i. Precision
      ii. Dead space
      iii. Hysteresis
      iv. Resolution.
   (b) An RC circuit consists of 10mF in series with a resistors of 5KW. A D.C voltage of 25 volts is suddenly applied across the circuit. Calculate the value of voltage after
      i. 4 msec.
      ii. 25 msec. [8+8]

3. (a) List the different types of strain gauges. Explain the construction and materials used for foil type strain gauges
   (b) Discuss the advantages, disadvantages and application for foil type strain gauges. [8+8]

4. (a) Mention different methods for measurement of earth resistance and explain any one in detail?
   (b) A Wheatstone bridge is connected for a Varley Loop test as shown in fig.7 when the switch is in position 1, the bridge is balanced with $R_1 = 1000\Omega$, $R_2 = 2000\Omega$, $R_3 = 100\Omega$. When switch is in position 2, the bridge is balanced with $R_1 = 1000\Omega$, $R_2 = 2000\Omega$, and $R_3 = 99\Omega$. If the resistance of the earthed wire is 0.15 km, how many metres from the bridge has the ground fault occurred? [8+8]

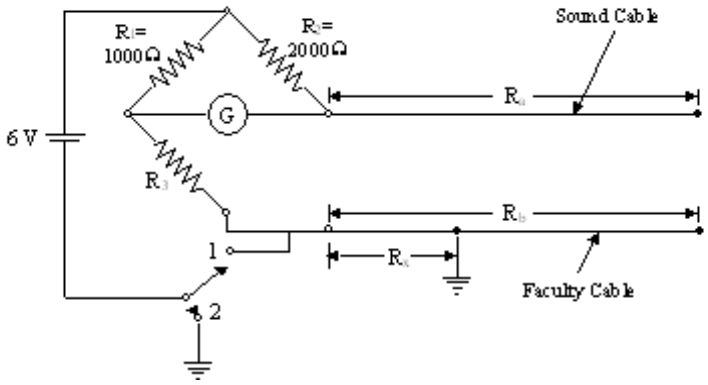

Figure 7

5. (a) A digital shaft encoder is used to control the position of the lift in a building having ten storeys such that the floor level is maintained within 10 mm. If the interfloor height is 3 m, what design of the encoder would be necessary?

   (b) Classify encoders? Explain the principle of working of Incremental position encoder. [8+8]

6. Describe the construction and working of:

   (a) Total radiation pyrometers

   (b) Infrared pyrometers [8+8]

7. (a) Explain measurement of pressure using capacitive transducer.

   (b) How the capacitive transducer is useful for the measurement of level of a non-conducting liquid. [8+8]

8. (a) Explain the working of Max Well's Bridge with necessary equations.

   (b) A Maxwell bridge is used to measure an inductive impedance. The bridge constants at balance are C_1, R_1=470kΩ, FR_2 = 5.1k Ω, R_3=100 kΩ, Find the series equivalent of the unknown impedance. [8+8]

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Code No: 07A31002 **R07** **Set No. 4**

II B.Tech I Semester Examinations,MAY 2011
SENSORS AND SIGNAL CONDITIONING
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the working of Max Well's Bridge with necessary equations.
   (b) A Maxwell bridge is used to measure an inductive impedance. The bridge constants at balance are C_1, R_1=470kΩ, FR_2 = 5.1k Ω, R_3=100 kΩ, Find the series equivalent of the unknown impedance. [8+8]

2. (a) List the different types of strain gauges. Explain the construction and materials used for foil type strain gauges
   (b) Discuss the advantages, disadvantages and application for foil type strain gauges. [8+8]

3. (a) A digital shaft encoder is used to control the position of the lift in a building having ten storeys such that the floor level is maintained within 10 mm. If the interfloor height is 3 m, what design of the encoder would be necessary?
   (b) Classify encoders? Explain the principle of working of Incremental position encoder. [8+8]

4. Describe the construction and working of:
   (a) Total radiation pyrometers
   (b) Infrared pyrometers [8+8]

5. (a) Explain measurement of pressure using capacitive transducer.
   (b) How the capacitive transducer is useful for the measurement of level of a non-conducting liquid. [8+8]

6. (a) Define the terms
      i. Precision
      ii. Dead space
      iii. Hysteresis
      iv. Resolution.
   (b) An RC circuit consists of 10mF in series with a resistors of 5KW. A D.C voltage of 25 volts is suddenly applied across the circuit. Calculate the value of voltage after
      i. 4 msec.
      ii. 25 msec. [8+8]

7. (a) Explain the operation of Charge amplifier.

(b) How the frequency response limitation of Chopper amplifier is overcome.[8+8]

8. (a) Mention different methods for measurement of earth resistance and explain any one in detail?

(b) A Wheatstone bridge is connected for a Varley Loop test as shown in fig.7 when the switch is in position 1, the bridge is balanced with R_1= 1000Ω , R_2= 2000Ω , R_3= 100Ω . When switch is in position 2, the bridge is balanced with R_1= 1000Ω , R_2= 2000Ω , and R_3= 99Ω . If the resistance of the earthed wire is 0.15 km, how many metres from the bridge has the ground fault occurred? [8+8]

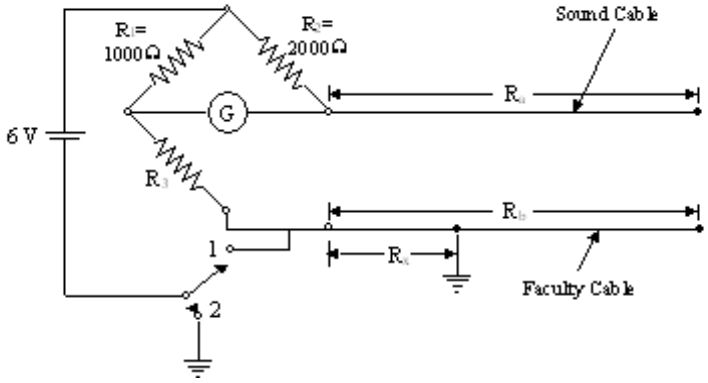

Figure 7

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Code No: 07A31002 **R07** **Set No. 1**

II B.Tech I Semester Examinations,MAY 2011
SENSORS AND SIGNAL CONDITIONING
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe the construction and working of:
   (a) Total radiation pyrometers
   (b) Infrared pyrometers [8+8]

2. (a) Explain the working of Max Well's Bridge with necessary equations.
   (b) A Maxwell bridge is used to measure an inductive impedance. The bridge constants at balance are C_1, R_1=470kΩ, FR_2 = 5.1k Ω, R_3=100 kΩ, Find the series equivalent of the unknown impedance. [8+8]

3. (a) Mention different methods for measurement of earth resistance and explain any one in detail?
   (b) A Wheatstone bridge is connected for a Varley Loop test as shown in fig.7 when the switch is in position 1, the bridge is balanced with R_1= 1000Ω , R_2= 2000Ω , R_3= 100Ω . When switch is in position 2, the bridge is balanced with R_1= 1000Ω , R_2= 2000Ω , and R_3= 99Ω . If the resistance of the earthed wire is 0.15 km, how many metres from the bridge has the ground fault occurred? [8+8]

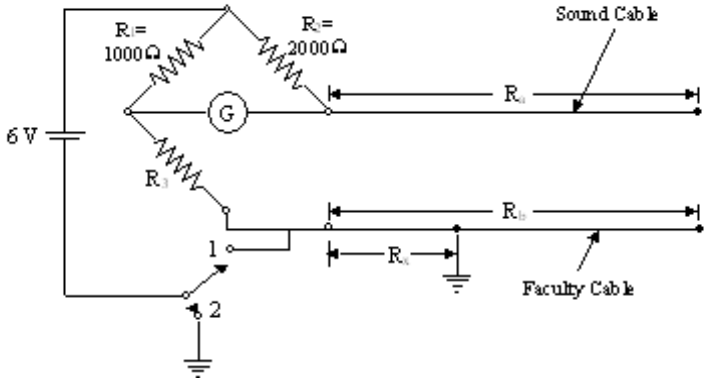

Figure 7

4. (a) List the different types of strain gauges. Explain the construction and materials used for foil type strain gauges
   (b) Discuss the advantages, disadvantages and application for foil type strain gauges. [8+8]

5. (a) Define the terms

i. Precision
ii. Dead space
iii. Hysteresis
iv. Resolution.

(b) An RC circuit consists of 10mF in series with a resistors of 5KW. A D.C voltage of 25 volts is suddenly applied across the circuit. Calculate the value of voltage after

i. 4 msec.
ii. 25 msec. [8+8]

6. (a) A digital shaft encoder is used to control the position of the lift in a building having ten storeys such that the floor level is maintained within 10 mm. If the interfloor height is 3 m, what design of the encoder would be necessary?

(b) Classify encoders? Explain the principle of working of Incremental position encoder. [8+8]

7. (a) Explain the operation of Charge amplifier.

(b) How the frequency response limitation of Chopper amplifier is overcome.[8+8]

8. (a) Explain measurement of pressure using capacitive transducer.

(b) How the capacitive transducer is useful for the measurement of level of a non-conducting liquid. [8+8]

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Code No: 07A31002 **R07** **Set No. 3**

II B.Tech I Semester Examinations,MAY 2011
SENSORS AND SIGNAL CONDITIONING
Instrumentation And Control Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe the construction and working of:
   (a) Total radiation pyrometers
   (b) Infrared pyrometers [8+8]
2. (a) List the different types of strain gauges. Explain the construction and materials used for foil type strain gauges
   (b) Discuss the advantages, disadvantages and application for foil type strain gauges. [8+8]
3. (a) Explain the working of Max Well's Bridge with necessary equations.
   (b) A Maxwell bridge is used to measure an inductive impedance. The bridge constants at balance are C_1, R_1=470kΩ, FR_2 = 5.1k Ω, R_3=100 kΩ, Find the series equivalent of the unknown impedance. [8+8]
4. (a) Explain measurement of pressure using capacitive transducer.
   (b) How the capacitive transducer is useful for the measurement of level of a non-conducting liquid. [8+8]
5. (a) Explain the operation of Charge amplifier.
   (b) How the frequency response limitation of Chopper amplifier is overcome.[8+8]
6. (a) Define the terms
      i. Precision
      ii. Dead space
      iii. Hysteresis
      iv. Resolution.
   (b) An RC circuit consists of 10mF in series with a resistors of 5KW. A D.C voltage of 25 volts is suddenly applied across the circuit. Calculate the value of voltage after
      i. 4 msec.
      ii. 25 msec. [8+8]
7. (a) Mention different methods for measurement of earth resistance and explain any one in detail?

(b) A Wheatstone bridge is connected for a Varley Loop test as shown in fig.7 when the switch is in position 1, the bridge is balanced with $R_1 = 1000\Omega$, $R_2 = 2000\Omega$, $R_3 = 100\Omega$. When switch is in position 2, the bridge is balanced with $R_1 = 1000\Omega$, $R_2 = 2000\Omega$, and $R_3 = 99\Omega$. If the resistance of the earthed wire is 0.15 km, how many metres from the bridge has the ground fault occurred? [8+8]

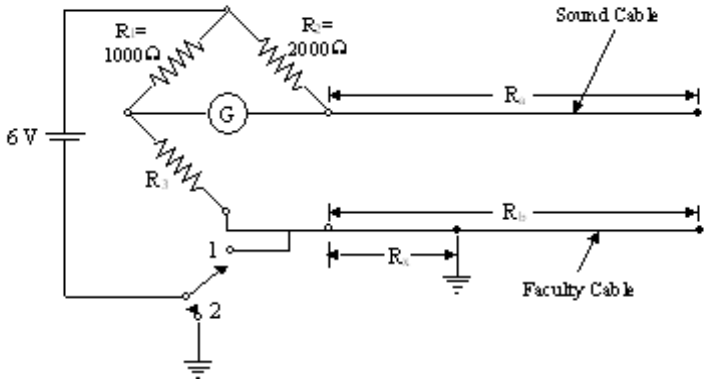

Figure 7

8. (a) A digital shaft encoder is used to control the position of the lift in a building having ten storeys such that the floor level is maintained within 10 mm. If the interfloor height is 3 m, what design of the encoder would be necessary?

(b) Classify encoders? Explain the principle of working of Incremental position encoder. [8+8]

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