

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-560027
MID-SEMESTER EXAMINATION-AUGUST 2019
B.Sc. Electronics - V Semester
EL 5115 - Sensors, Transducers and Instrumentation

13.08.2019

Time: 60 min.

Max. marks:30

PART-A

Answer any three of the following:

3 x 6 =18

1. a) Differentiate between active and passive transducers.
b) List the transducers under the category of Electrical, Temperature and Mechanical transducers. Mention the physical quantities measured using each transducer. (2=4)
2. Explain with the help of diagrams the method of measurements of displacement using change in self inductance due to (i) change in number of turns (ii) change in permeability (iii) change in reluctance.
3. What is a thermocouple? Mention different type of thermocouples. Explain the construction of thermocouple.
4. a) Draw current to voltage converter circuit and write expression for its output. Give one application of the circuit.
b) Draw integrator circuit and obtain expression for its output. (3+3)
5. Draw instrumentation amplifier and derive expression for its output.

PART-B

Answer any two of the following:

2 x 4 =8

6. A resistance strain gauge with gauge factor 3 is cemented to a steel membrane which is subjected to a strain of 1×10^{-6} . If the original resistance of the gauge is 120Ω , calculate the change in resistance.
7. A platinum resistance thermometer has a resistance of 120Ω at 25°C . Find its resistance at 80°C .
8. Design a differentiator to differentiate an input of signal of 40Hz to 100Hz.

PART-C

Answer any two of the following:

2 x 2 =4

9. Are all sensors transducers? Justify your answer.
10. How do we get temperature measurement from IC34?
11. What is the need for signal conditioning in measurement system?

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