School of Computing Science and Engineering

Bachelor of Technology in Computer Science and Engineering
Semester End Examination - Jun 2024

Duration : 180 Minutes
Max Marks : 100

Sem IV - G2UA420T - Sensors

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Define electrostatic transducer?   K1(2)

2) Describe the basic construction and operation of an electrochemical cell.   K2(4)

3) Describe the environmental parameter of Sensor   K2(6)

4) Discuss the operation of potentiometer-based transducer with an example of application. A displacement transducer with shaft stroke of 3 inch is applied to the circuit. Total resistance of potentiometer is 5k ohms. The applied voltage is Vs = 5 V. When wiper is 0.9 inch from the end of potentiometer wire, what is the output voltage?   K3(9)

5) Describe the operation of a junction photocell, also called a photodiode or a reverse biased p-n junction. Draw its equivalent circuit. Obtain an expression for the current density in the depletion region in terms of optical flux, incident radiation frequency, internal efficiency, air-semiconductor reflection coefficient and absorption coefficient.   K3(9)

6) Describe the technique used by optical fibre to be used as stress sensing? Describe a microbend sensor and discuss its operation.   K5(10)

7) Discuss the working of electromagnetic flowmeter for measuring flow rate of conducting fluids.   K4(12)

8) (a) Differentiate between temperature and heat? What are primary thermometers? Are they useful in industrial practice? (b) An A.C. LVDT has following data: Input = 6.3V; Output = 5.2V; Range=±0.5 inch. Calculate (i) output voltage versus position for core movement going from +0.45 inch to -0.30 inch. (ii) The output voltage when core is -0.25 inch from center.   K5(15)

9) In what different modes can a p-n junction be used for radiation detection. Explain their operations with diagrams.   K5(15)

10) Discuss principle, construction, working and application of Linear Variable Differential Transformer (LVDT).   K6(18)