



UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE	: DEI 2002
COURSE	: SENSOR TECHNOLOGY
SEMESTER/SESSION	: 2-2022/2023
DURATION	: 2 HOURS

Instructions:

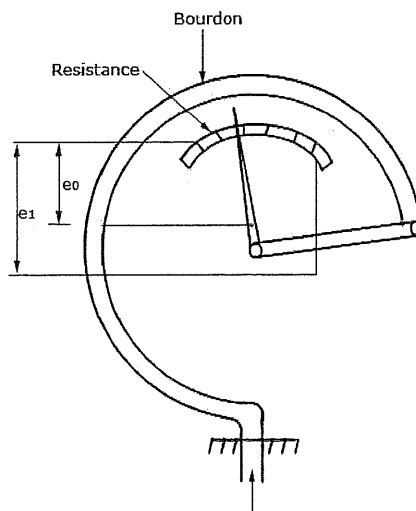
1. This booklet contains 4 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise up your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 5 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

- a) List FIVE (5) types of temperature sensors. (5 marks)
- b) Name FIVE (5) semiconductor temperature application. (5 marks)
- c) Describe the operation of Bourdon Tube transducer as shown by FIGURE1. (8 marks)
- d) Explain the advantages and disadvantage thermistor sensor. (6 marks)
- e) Explain the difference between inductive and capacitive proximity sensor in term of sensing element and material detection ability. (6 marks)

**Figure 1**

QUESTION 2

- a) Explain the construction of thermistor. (3 marks)
- b) Limit switch is one of the position sensors that is widely used industrial control devices and consumer appliances. State THREE (3) advantages of using limit switches. (6 marks)
- c) Thermocouple is a type of analogue temperature sensor that converts temperature to voltage. Describe the operation of thermocouple. (4 marks)
- d) Explain the operating principle of Reed Switches in Figure 2. (6 marks)

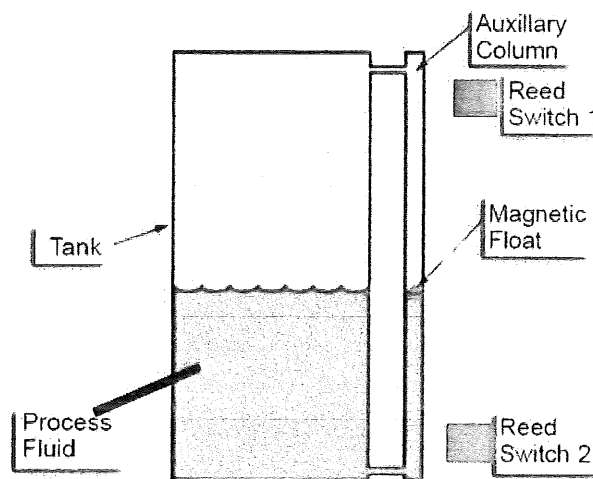


Figure 2

QUESTION 3

- a) List FOUR (4) types of thermocouple. (4 marks)
- b) Explain the most difference between Resistance Temperature Detector (RTD) and thermocouple. (4 marks)
- c) Describe a proximity sensor. (4 marks)
- d) Calculate the voltage output from Wheatstone bridge circuit in FIGURE 3 if the resistance value of the strain gauge is $20\ \Omega$. (10 marks)

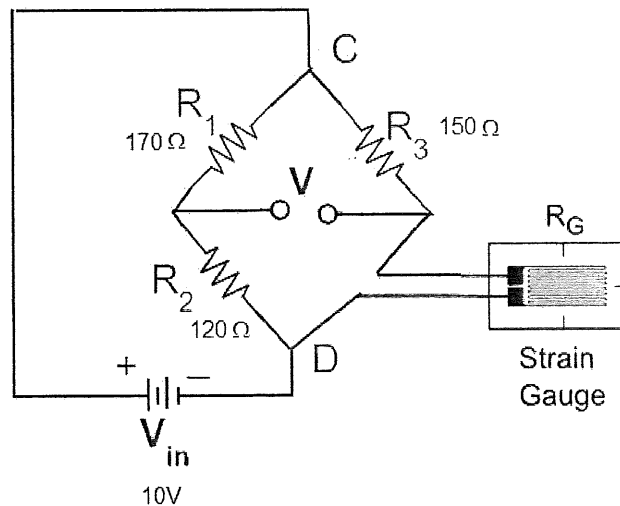


Figure 3

QUESTION 4

- a) List TWO (2) types of proximity sensor. (2 marks)
- b) List TWO (2) disadvantages of thermocouple sensor. (2 marks)
- c) Describe thermocouple characteristics. (4 marks)
- d) List THREE (3) types of level measurement. (3 marks)
- e) List FOUR (4) application of infrared sensor. (4 marks)
- f) Name FOUR (4) advantages and disadvantages of infrared sensor. (8 marks)
- g) Describe working principle of infrared remote control. (6 marks)

-----End of question-----

