



UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE	: DEE 1013
COURSE	: INDUSTRIAL INSTRUMENTATION
SEMESTER/SESSION	: 1-2023/2024
DURATION	: 3 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 FOUR (4) types of level measurement. (4 marks)
- b) Describe the definition of:
- i. Pressure measurement. (2 marks)
 - ii. Pressure gauge. (2 marks)
 - iii. Bourdon tube. (2 marks)
 - iv. Strain gauge. (2 marks)
- c) Describe TWO (2) types of level measurement commonly used in industrial measurement. (4 marks)

QUESTION 2

- a) List FIVE (5) types of temperature sensors. (5 marks)

- b) Bimetallic strips formed by joining two different metals having different thermal expansion coefficients. List three (3) advantages and three (3) disadvantages of Bimetallic strips. (6 marks)

- c) Give TWO (2) advantages and disadvantages of electromagnetic flow meter. (4 marks)

- d) Describe the difference between thermistor and thermocouple. (6 marks)

- e) Illustrate the working principle of electromagnetic flow meter. (10 marks)

QUESTION 3

- a) Give FIVE (5) types of mechanical actuator power source to operate a valve. (5 marks)
- b) List FIVE (5) fundamental parts of the control valve. (5 marks)
- c) Describe the TWO (2) types of pneumatic control valve actuator. (6 marks)
- d) Describe the operation of electrical positioner in valve actuator. (4 marks)
- e) Explain the purpose of valve positioner. (5 marks)
- f) Explain the operation of control valve as shown by figure 1. (5 marks)

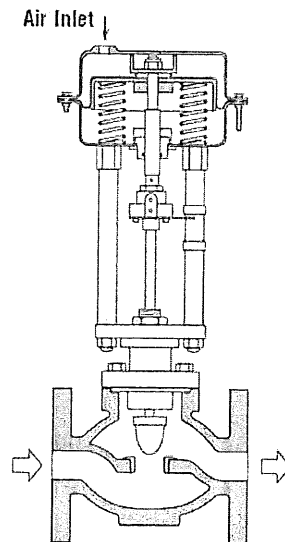


Figure 1: Control Valve

QUESTION 4

- a) List FOUR (4) fundamental parts of the valve. (4 marks)
- b) Select and describe a suitable valve based on the application below:
- (i) Valve is use to fully open and fully shut-off the gas flow in a pipe. (2 marks)
 - (ii) Valve for throttling. (2 marks)
 - (iii) Valve for quick opening. (2 marks)
 - (iv) Valve that allows one way direction. (2 marks)
 - (v) Valve for safety to release the air pressure. (2 marks)
- c) Describe a Globe Valve. (6 marks)
- d) Give THREE (3) advantages of Globe Valve. (3 marks)

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

