UNIVERSITY COLLEGE TATI

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DEE 1013
COURSE	: INDUSTRIAL INSTRUMENTATION
SEMESTER/SESSION	: 2-2024/2025
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) Describe the meaning of :

i. Instrumentation (2 marks)

ii. Measurement (2 marks)

iii. Instrument (2 marks)

iv. Electronics instrument (2 marks)

b) There are two methods used in industries for measuring liquid levels which are direct method and indirect method. Describe the meaning of:

i. Direct Method (2 marks)

ii. Indirect Method (2 marks)

c) The dip stick is one method of measuring liquid levels which is widely used in automation or industrial area. Describe the operation of dip stick. (4 marks)

QUESTION 2

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

b) List three (3) types of differential pressure flow meters. (3 marks)

c) The vortex transmitter is one of the flow meter generally used in industry. List three (3) common application can be used using this transmitter. (3 marks)

d) List three (3) measuring conditions that can be used/applied using differential pressure transmitter in industry. (3 marks)

e) Give two (2) advantages and disadvantages of electromagnetic flow meter. (4 marks)

f) Describe the meaning of Differential Pressure. (2 marks)

g) Convert the temperature scale given below to the equivalent scale.

i. 40°C to °K (5 marks)

ii. -20°F to °C (5 marks)

QUESTION 3

a) List five (5) fundamental parts of the valve. (5 marks)

b) List two (2) types of pneumatic actuator. (2 marks)

c) There are a few considerations to look into before using a valve in the industry. Give five (5) valve selection considerations based on priority. (5 marks)

d) Describe control valve. (2 marks)

e) Classify three (3) valve categories commonly used based on mechanical motion. (3 marks)

f) Describe valve positioner. (3 marks)

g) Give two (2) advantages and disadvantages of electric actuator. (4marks)

h) There are two (2) types of electrical actuators generally used in industry. Describe the function of the electrical actuators.

i. Valve Motor Drive (VDM) (3 marks)

ii. Modulating (3 marks)

QUESTION 4

a) Define a Globe Valve. (2 marks)

b) Define the function of Ball Valve. (2 marks)

c) Butterfly Valves are rotary motion valves usually used to stop, regulate and start fluid flow. List three (3) advantages of using this valve. (3 marks)

d) Gate Valve flow is controlled by raising or lowering the valving element. Gate valves are not usually used to regulate flow because the valving element can be damaged when in the partially open position. List four (4) disadvantages of using this valve. (4 marks)

e) Give two (2) advantages and disadvantages of Globe Valve. (4 marks)

f) Describe the importance of using Gate Valve in controlling liquid/gas flow. (3 marks)

g) Check Valves are designed to prevent the reversal of flow in a piping system. Explain the of reversal flow in Check Valves. (5 marks)

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