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Question Paper Code	13566
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Fourth Semester

Instrumentation and Control Engineering

(Common to Electronics and Instrumentation Engineering)

20ICPC402 - INDUSTRIAL INSTRUMENTATION

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	Marks	K- Level	CO
1. If shear stress is proportional to velocity gradient, fluid is called as (a) Newtonian fluid (b) Laminar fluid (c) Viscous fluid (d) None of the mentioned	1	K1	CO1
2. Relative humidity is a function of _____ (a) Ambient temperature (b) Ambient temperature and Water vapor pressure (c) Water vapor pressure (d) Dryness	1	K1	CO1
3. Output of a bimetallic element will be _____ (a) Strain (b) Displacement (c) Pressure (d) Voltage	1	K1	CO2
4. _____ quantities can be measured using bellows? (a) Absolute pressure (b) Gauge pressure (c) Differential pressure (d) All of the mentioned	1	K1	CO2
5. The value of discharge coefficient in orifice is usually between _____ (a) 0.1-0.5 (b) 0.5-0.8 (c) 0.9-1.0 (d) 1.0-2.0	1	K1	CO3
6. Example for positive displacement meter is (a) Variable area flow meter (b) Turbine meters (c) Rotary piston meter (d) Venturi	1	K1	CO3
7. The weirs are categorized into _____ types based on the shape of the crest? (a) One (b) Two (c) Three (d) Four	1	K1	CO4
8. Solid flow rate measurement is commonly done using _____ (a) Coriolis mass flow meter (b) Ultrasonic transit-time meter (c) Electromagnetic sensor (d) Weighing and belt conveyor method	1	K1	CO4
9. Gauge glass techniques is a _____ type of method (a) Direct (b) Indirect (c) Electrical (d) Hydrastep method	1	K1	CO5
10. The function of a differential pressure transmitter in level measurement is to _____ (a) Detects pH value (b) Measures air flow (c) Measures level based on liquid pressure difference (d) None of the above	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. Enumerate the difference between humidity and relative humidity.	2	K2	CO1
12. Define the term absolute viscosity.	2	K1	CO1
13. What is the basic principle of dew cell hygrometer?	2	K1	CO1
14. State the basic principle on which the bimetallic thermometer works.	2	K1	CO2
15. Differentiate between gauge pressure and absolute Pressure.	2	K2	CO2
16. List the elastic types of pressure gauges.	2	K1	CO2
17. Define coefficient of discharge.	2	K1	CO3
18. State the principle of oval gear positive displacement type flow meter.	2	K1	CO3
19. Why does a flowmeter need calibration?	2	K1	CO4

20. State the principle of vortex shedding flow meter. 2 K1 CO4
21. List the advantages of float type level measurement. 2 K1 CO5
22. What is a pneumatic pressure transmitter? 2 K1 CO5

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23. a) Summarize about viscosity with the help of a neat diagram explain the two float type viscometer. 11 K2 CO1

OR

- b) Comment on psychrometer and how does it differ from a hygrometer? Explain any one Psychrometer in detail. 11 K2 CO1

24. a) Using a neat sketch explain the working of a bimetallic thermometer along with its types. 11 K2 CO2

OR

- b) Illustrate about the methods of pressure measurement using any two manometer. 11 K2 CO2

25. a) State Bernoulli's theorem and describe the construction and working of different types of orifice meter. 11 K2 CO3

OR

- b) With neat diagram explain the construction and working principle of any two positive displacement type flow meter and also state its advantages. 11 K2 CO3

26. a) On what principle does an electromagnetic flow meter function and explain the working of electromagnetic flow meter with a neat sketch. 11 K2 CO4

OR

- b) Explain the principle and working of Target flow meter with a neat sketch. 11 K2 CO4

27. a) Explain the principle and working of Hydrastep method. 11 K2 CO5

OR

- b) With suitable sketch explain the working of any two flow transmitter in detail. 11 K2 CO5

28. a) (i) Justify the need for solid flow rate measurement with an example and explain any one method of solid flow measurement with a neat sketch. 6 K2 CO4

- (ii) Elaborate the necessity for boiler drum level measurement in a power plant and with a suitable diagram explain boiler drum level measurement process. 5 K2 CO5

OR

- b) (i) Elaborate in detail about the guidelines for selection of flow meter. 6 K2 CO4

- (ii) Differentiate between a conventional transmitter and a smart transmitter with a suitable diagram. 5 K2 CO5