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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

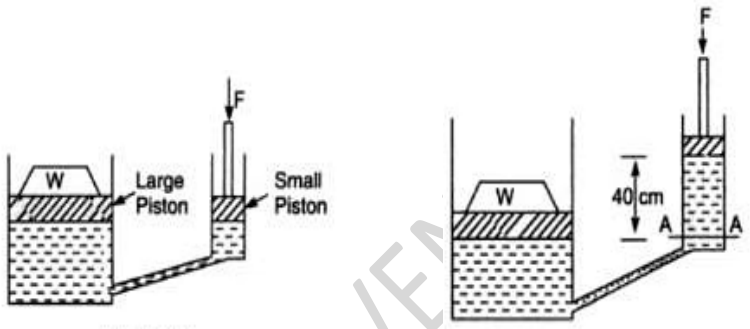
August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Electronics and Instrumentation Engineering **Duration: 3 hrs.**
Course Code: 23EI4PCTNI **Max Marks: 100**
Course: Transducers and Instrumentation

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		MODULE - I	CO	PO	Marks
1	a)	Differentiate between transducer and sensor with example.	CO1	PO1	**05**
	b)	Explain Different IO Configurations	CO1	PO1	**05**
	c)	Illustrate with block diagram, the functional elements of an instrument system.	CO1	PO1	**10**
		MODULE- II			
2	a)	Illustrate the working principles of an Orifice Plate Flow Meter by applying its design features to real-world scenarios.	CO2	PO2	**10**
	b)	An oil of viscosity 0.5 Ns/m2 and relative density 0.6 is flowing through a circular pipe of diameter 60 cm and of length 500 m. The average velocity of the oil is 2 m/s. Determine the Reynolds number and state whether the flow is laminar or turbulent	CO2	PO3	**05**
	c)	Through a refinery, fuel ethanol is flowing in a pipe at a velocity of 1 m/s and a pressure of 101300 Pa. The refinery needs the ethanol to be at a pressure of 2 atm (202600 Pa) on a lower level. How far must the pipe drop in height in order to achieve this pressure? Assume the velocity does not change. The density of ethanol is 789 kg/m3 and gravity g is 9.8 m/s2.	CO2	PO3	**05**
		OR			
3	a)	Explain with the help of a neat diagram the working of an Rotameter and describe its advantages and disadvantages	CO2	PO2	**10**
	b)	With a neat diagram, Explain the working of an Electromagnetic flow meter	CO2	PO2	**10**
		MODULE- III			
4	a)	PT-100 is a Platinum RTD whose resistance at 0°C is 100ohm. If 3.91X10-3/°C is the resistance temperature co-efficient of Platinum, then find its resistance at 100°C.	CO3	PO3	**05**

		b)	A thermocouple has a linear sensitivity of 30uv/C, calibrated at a cold junction temperature of 0°C. It is used measure an unknown temperature with the cold junction temperature of 30°C. Find the actual hot junction temperature if the emf generated is 3.0 mv.	*CO3*	*PO3*	**05**
		c)	Mention the different types of Thermocouple available and explain its characteristics	*CO3*	*PO2*	**10**
			MODULE - IV			
	5	a)	Explain in detail, with a neat sketch the working of McLeod Vacuum Gauge	*CO4*	*PO2*	**10**
		b)	The diameters of a small piston and a large piston of a hydraulic jack are 3 cm and 10 cm respectively. A force of 80 N is applied on the small piston. Find the load lifted by the large piston when: (a) the pistons are at the same level. (b) small piston is 40 cm above the large piston. The density of the liquid in the jack is given as 1000 kg/m3  *Figure 5(b)*	*CO4*	*PO3*	**10**
			OR			
	6	a)	With a neat sketch, Explain the working principle of a dead weight tester	*CO4*	*PO2*	**10**
		b)	Write a note on Elastic type Pressure Gauges	*CO4*	*PO2*	**10**
			MODULE - V			
	7	a)	Detail the step-by-step process of designing a cloud-based home automation system, incorporating a framework that outlines each component's role within the system. What will be the conceptual equation for the application?	*CO4*	*PO3*	**12**
		b)	What is a IoT? Break down the individual technologies behind the Internet of Things, examining their roles, interdependencies, and how they collectively contribute to the seamless functioning of IoT applications.	*CO4*	*PO3*	**08**

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