

COLLEGE OF ENGINEERING, PUNE-5
(An Autonomous Institute of Govt. of Maharashtra)

End Semester Exam
(IE 201) Transducers

Programme: S. Y. B. Tech Instrumentation

Year: 2011-12

Semester III

Duration: 2 Hrs

Max. Marks: 50

Instructions:

1. Figures to right indicate full marks.
2. Draw neat diagrams wherever required.
3. All questions are compulsory.

Q.1	A	Explain Chemical sensors in detail.	4
	B	It is possible to measure the vibration using photoelectric principle based transducer. True or False. Justify.	3
	C	Explain the principle of stroboscopes.	3
Q.2	A	Write a note on laws of thermoelectricity.	4
	B	Draw a instrumentation scheme for measurement of temperature, pressure, vibration of a pipeline carrying oil. And flow.	4
	C	What do you mean by primary calibration and secondary calibration?	2
Q.3	A	Explain the measurement of pressure with diaphragm element and inductive transducer.	4
	B	Derive a formula for sensitivity calculation of high wire pressure transducer.	3
	C	Draw a neat diagram of photoelectric transducer for pressure measurement. What are the advantages of the same?	3
Q.4	A	Describe the variable head and variable area flow meter. How to calculate Q from same flow meter.	4
	B	Describe the principle of electromagnetic flow meter.	2
	C	An Electromagnetic flow meter having a flow tube of 150 mm	2

		diameter gives an output voltage of 60 mV for a magnetic flux density of 5000 V-s/cm ² . Determine the rate of discharge of liquid through the flow meter.	
	D	A laser Doppler anemometer employs a He-Ne laser ($\lambda=632.8$ nm) to measure the velocity of flow at a point in a dusty gas. A 160 mm focusing lens having $\theta=12^\circ$ is used to operate the LDA in the dual beam mode. Estimate the velocity of flow if the Doppler shift in frequency was found to be 1.62 MHz	2
Q.5	A	Explain Resistive method of level measurement with minimum four advantages and disadvantages.	4
	B	Explain the level measurement technique based on absorption of rays. Discuss the applications of the same.	4
	C	Explain any two sound measurement techniques.	2

All the best