* S E - 8 2 9 0 / 3 0 0 *

SE-8290

B. E. - III (Sem. V) (Instrumentation & Control) Examination

May / June – 2011

Sensors & Signal Conditioning

Time :3 Hours] [Total Marks : **100**

Instructions : (1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ B. E. - 3 (SEM. 5) (INSTRUMENTATION & CONTROL)

Name of the Subject :

☛ Sensors & Signal Conditioning

☛ Subject Code No. : 8 2 9 0 ☛ Section No. (1, 2,.....) : 1&2

Seat No. :

Student's Signature

Instructions:
(1) Attempt all Questions.
(2) Figure to the right indicates marks.
(3) Answer of two sections must be written in separate answer books.

Section I

Q-1 (a)	Answer the Following questions.	(10)
1	Define transducer?	2
2	Differentiate between accuracy and precision.	4
3	Define bandwidth	2
4	Why dummy strain gauges are used?	2
Q-1(b)	What are the different types of static errors? Explain each of them.	8
Q-2(a)	With a neat sketch, explain the construction and working of inductive methods of thickness measurement.	8
Q-2(b)	Define the term pH. Explain the working principle of pH measurement.	8
	OR	
Q-2(a)	Explain the operating principle of strain gauge? And also define its gauge factor.	8
Q-2(b)	Name different types of photo-electric transducer. Explain any one in detail.	8
Q-3	Explain any two	16
1	Phase angle measurement	
2	Piezoelectric transducer	
3	Capacitive transducer	

Section II

Q-4 (a)		Answer the Following questions.	
	1	What is comparator?	2
	2	Bandwidth of high pass filter is_____	1
	3	Slew rate of high frequency op-amp is _____	1
	4	A high pass filter has a time constant of τ. Its gain at a frequency ω is_____	2
	5	Give ideal characteristics of an op-amp?	4
Q-4(b)		What are the important types of active filters? Give a brief note on each	8
Q-5(a)		Give basic circuit diagram of function generator and derive the expression of frequency for the same along with its waveforms.	8
Q-5(b)		Explain second order low pass butterworth filter. Derive necessary expression.	8
		OR	
Q-5(a)		Draw the scheme of sample and hold circuit and explain its operation and application	8
Q-5(b)		What is data logger and what is its role in field of instrumentation?	8
Q-6		Explain any two	
	1	Voltage to frequency converter	8
	2	Wien-bridge oscillator	8
	3	Amplitude modulators	8