



## End Semester Examination – Nov/Dec – 2016

Code : 14EI2048  
Sub. Name : Instrumentation and Control Systems

Semester : 2016-17 ODD  
Duration : 3hrs  
Max. marks : 100

### ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Describe the Fundamental measurement Process and draw the block diagram of generalized measurement system with example.	CO1	(15)
	b.	Define error and list the types of error.	CO1	(5)
(OR)				
2.	a.	What is recorder? How it is classified? Explain the working of X Y recorder?	CO1	(15)
	b.	How galvanometer can be converted into a voltmeter?	CO1	(5)
3.	a.	Explain briefly the construction and working of bourdon tubes for measurement of pressure.	CO1	(15)
	b.	Explain briefly the integrating Instrument with example.	CO1	(5)
(OR)				
4.	a.	Explain briefly the construction and working of a Thermocouple.	CO1	(15)
	b.	Explain how the Wheatstone bridge circuit may be utilized for the measurement of temperature.	CO1	(5)
5.	a.	With relevant diagram explain the different types of strain gauge.	CO1	(15)
	b.	Explain how weight Measured using Strain Gauge.		(5)
(OR)				
6.	a.	With neat diagram explain the construction and working of Hot-wire anemometer.	CO1	(15)
	b.	Explain the ultrasonic flow meter using the travel time difference method.	CO1	(5)
7.	a.	Find the overall transfer function of the system for the signal flow graph shown below.	CO3	(15)
	b.	What are the basic properties of signal flow graph?	CO3	(5)
(OR)				
8.	a.	Construct Routh array and determine the stability of the system represented by the characteristic equation, $s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0$ . Comment on the location of the roots of characteristic equation.	CO2	(15)
	b.	What is the necessary condition for stability? Explain the relation between stability and coefficient of characteristic Polynomial.	CO2	(5)
<b><u>Compulsory:</u></b>				

9.	a.	The open loop transfer function of a unity feedback control system is given by $G(s) = \frac{1}{s(1+s)(1+2s)}$ . Sketch the polar plot and determine the phase margin and gain margin.	CO2	(15)
	b.	Find the type and order of the following system transfer function (i) $G(s) = \frac{K}{(s+1)(s+2)}$ (ii) $G(s) = \frac{k}{s(s+1)}$	Co2	(5)

ALL THE BEST