Duration: 3hrs **[Max Marks:80]**

N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1		Attempt **any FOUR**	**[20]**
	a	Define sensitivity with suitable examples.	**[5]**
	b	State the differences between accuracy and precision with suitable examples	**[5]**
	c	Explain the block diagram of a generalized measurement system	**[5]**
	d	Explain the general rules for constructing a root locus plot.	**[5]**
	e	State the advantages and disadvantages of frequency domain analysis of a system.	**[5]**
2	a	Discuss the process of measurement of low resistance by a Kelvin Double bridge.	**[10]**
	b	Derive an expression for measurement of capacitance by Schering bridge.	**[10]**
3	a	Explain the process of measurement of inductance by a Maxwell bridge. State the applications of Maxwell bridge.	**[10]**
	b	State the procedure of measurement of high resistance by a mega-ohm bridge.	**[10]**
4	a	Sketch the root locus of the system with open loop transfer function $$G(s) = \frac{k}{s(s^2 + 8s + 15)}$$	**[10]**
	b	A unity feedback system has an open loop transfer function $G(s)H(s) = \frac{k}{s(s^2+2s+2)}$. Sketch the root locus and determine the limiting value of k for stability	**[10]**
5	a	Draw the bode plot of the system having $G(s) = \frac{100}{s(1+0.5s)(1+0.1s)}\ H(s) = 1$	**[10]**
	b	Draw the Bode plot for the following transfer function $G(s)H(s) = \frac{800}{s^2(s+10)(s+40)}$. Comment on the stability of the system.	**[10]**
6		Attempt **any FOUR**	
	a	Define the terms with suitable examples a) resolution b) hysteresis	**[5]**
	b	Write a short note on measurement of medium resistance using Wheatstone bridge	**[5]**
	c	Explain how stability analysis is done using Root locus in time domain.	**[5]**
	d	Explain advantages and disadvantages of polar plots	**[5]**
	e	Derive the equation of measurement of inductance by a Hey bridge.	**[5]**

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