

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]**
- Define sensitivity with suitable examples. [5]
 - State the differences between accuracy and precision with suitable examples [5]
 - Explain the block diagram of a generalized measurement system [5]
 - Explain the general rules for constructing a root locus plot. [5]
 - 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 [10]
- $$G(s) = \frac{k}{s(s^2 + 8s + 15)}$$
- 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**
- Define the terms with suitable examples a) resolution b) hysteresis [5]
 - Write a short note on measurement of medium resistance using Wheatstone bridge [5]
 - Explain how stability analysis is done using Root locus in time domain. [5]
 - Explain advantages and disadvantages of polar plots [5]
 - Derive the equation of measurement of inductance by a Hey bridge. [5]
