Register Number: ……..

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Third Semester

TEXTILE TECHNOLOGY

EEE252:Instrumentation and Control Systems

(Semi log graph sheet to be Provided)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which of the following instruments indicate the instantaneous value of the electrical quantity being measured at the time at which it is being measured
   a) Absolute instruments b) Indicating instruments
   c) Recording instruments d) Integrating instruments
2. Which of the following can be measured by LVDT
   a) Displacement b) Vibration
   c) Time d) Frequency
3. _____ directly converts temperature into voltage
   a) Potential meter b) Thermocouple
   c) Gear Train d) LVDT
4. Rotameter is a flow meter based on
   a) Variable Area b) Variable Length
   c) Variable pressure d) Variable Level
5. Strain gauge is insensitive to
   a) Tensile force b) Compressive force
   c) Lateral force d) Shear force
6. Which of the following instrument is used for measuring torque
   a) Manometer b) Dynamometer
   c) Flow meter d) Bourdon tube
7. If the gain of the critical Damped system is increased, it will behave as
   a) Oscillatory b) Critically damped
   c) Over Damped d) Under damped
8. The Integral Control
   a) Increase the stedy state error b) Decrease the stedy state error
   c) Increases the Noise and stability d) Decreases the damping co efficient
9. By which of the following the system response can be tested better
   a) Ramp input signal b) Sinusoidal input signal
   c) Unit Impulse input signal d) Exponentially decaying signal
10. With feedback _____increases
    a) System stability b) Sensitivity
    c) Gain d) Effects of disturbing signals

PART B (10 x 2 = 20 Marks)

11. For what purpose mechanical type vibration instruments are used?
12. List the types of instruments.
13. List some of the disadvantages of bimetallic thermometers.
14. What are the advantages of strain gauge pressure transducer?
15. Define load cell.
16. What are the types of torque transducer?
17. What is PD controller?
18. What is a signal flow graph?
19. .What is the necessary and sufficient condition for stability.
20. List out the different frequency domain specifications?

PART C (5 x 14 = 70 Marks)

21. a) (i) What are the basic blocks of a generalized instrumentation system? Draw the various blocks and explain their functions. (10)
    (ii) Briefly explain the classification of instruments (4)

    (OR)

    b) (i) Explain the construction and working principle of LVDT (8)
    (ii) Briefly explain the different types of errors. (6)

22. a) Give short notes on
    (i) Bourdon tube
    (ii) Thermistor

    (OR)

    b) (i) How to measure the flow using Hotwire anemometer? (7)
    (ii) Explain in detail the capillary viscometer with diagram (7)

23. a) What are strain gauges? Derive the expression for gauge factor for a strain gauge

(OR)

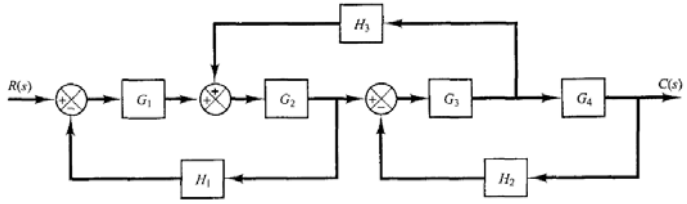
b) Explain how force measurement is done with hydraulic force meter and pneumatic load cells.

24. a) (i) Compare open loop control systems with closed loop control systems (7)

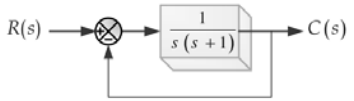
(ii) Give short notes on servo mechanism (7)

(OR)

b) Simplify the block diagram shown in Figure then, obtain the closed-loop transfer function C(s)/R(s).



25. a) Determine the values of Delay time, Rise time, Peak time and settling time when the control system shown in Figure is subject to a unit step input



(OR)

b) The open-loop transfer function of a control system is

$$L(s)=\frac{10}{s(s/100+1)}$$

Draw the Bode plot for the given system

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