14 JUN 2023

Reg. No.												

Question Paper Code	11880

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Sixth Semester

Production Engineering

20ESIC601 - INSTRUMENTATION AND CONTROL SYSTEMS

(Regulations 2020)

(Semilog Graph and Graph Sheet need to be provided)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Differentiate Accuracy and Precision.	2,K2,CO1
2.	Specify the necessity of calibration.	2,K2,CO1
3.	How is shock measured?	2,K2,CO2
4.	Compare Stress and strain.	2,K2,CO2
5.	Mention the function of X-Y recorder.	2,K1,CO3
6.	How the data display can be done in LCD?	2,K2,CO3
7.	Define Transfer function.	2,K1,CO4
8.	Express and notate Mason's gain formula.	2,K2,CO4
9.	What are time domain specifications?	2,K1,CO5
10.	Define phase cross over frequency.	2,K1,CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain the various Static and Dynamic characteristics of measurement Systems in brief.	13,K2,CO1
		OR	
	b)	How is the statistical evaluation of measurement data performed? Explain in detail.	13,K2,CO1
12.	a)	(i) Describe the displacement measurement in brief.	7,K2,CO2
		(ii) How to measure the linear velocity? Give a brief explanation.	6,K2,CO2
		OR	
	b)	(i) With a necessary diagram, explain in brief about pressure measurement.	7,K2,CO2
		(ii) Discuss the temperature measurement in brief.	6,K2,CO2

13. a) Explain the working and operating procedures of Cathode Ray Oscilloscope with neat diagram. *13,K2,CO3*

OR

b) Describe in brief about digital printers and data loggers. *13,K2,CO3*

14. a) Determine the transfer function $\frac{X_1(S)}{F(S)}$ and $\frac{X_2(S)}{F(S)}$, for the given system as shown in Figure 1: *13,K3,CO4*

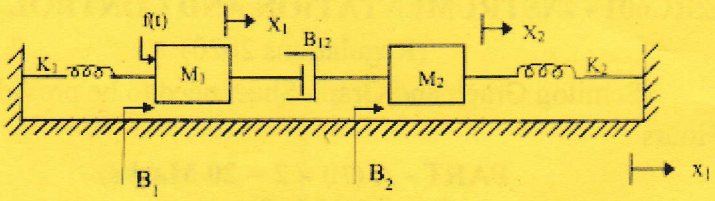

Figure 1

OR

b) The block diagram of a closed loop system is shown in Figure 2. Using the block diagram reduction technique determine the closed loop transfer function C(S) / R(S). *13,K3,CO4*

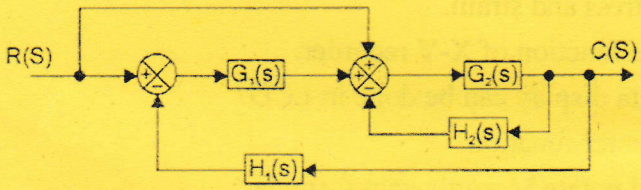

Figure 2.

15. a) Obtain the response of unity feedback system whose open loop transfer function is G (S) = $\frac{4}{S(S+5)}$ and when the input is unit step. *13,K3,CO5*

OR

b) For a unity feedback control system the open loop transfer function, $(s) = \frac{10(s+2)}{s^2(s+1)}$. Find the steady state error when the input is R(s), where R(s) = $\frac{3}{s} - \frac{2}{s^2} + \frac{1}{3s^3}$. *13,K3,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Explain the working of Magnetic tape recorder in detail. *15,K2,CO3*

OR

b) Sketch the magnitude and phase of the Bode plot. Determine the gain margin and phase margin of the system. $G(s) = \frac{10}{s(1+0.5s)(1+0.05s)}$. *15,K3,CO5*