Reg. No.															

Question Paper Code	12858

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Third Semester

Mechanical and Automation Engineering

20EIPC304 – BASIC ELECTRONICS AND CONTROL SYSTEM

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Mention the applications of Zener diode.	2	K1	CO1
2.	Compare JFET with BJT.	2	K2	CO1
3.	What is an Oscillator?	2	K1	CO2
4.	Define input offset voltage.	2	K1	CO2
5.	What are the available standard analog signals?	2	K1	CO3
6.	What is the main drawback of a dual-slop ADC?	2	K1	CO3
7.	What are the basic elements used for mechanical translational system?	2	K1	CO4
8.	Write the Mason's gain formula.	2	K1	CO4
9.	Define damping ratio.	2	K1	CO5
10.	List the time domain specifications.	2	K1	CO5

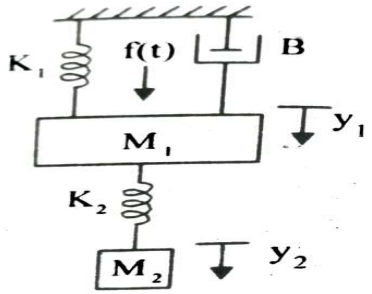
PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Describe the working, operation and characteristics of MOSFET.	13	K2	CO1
		OR			
	b)	With a neat diagram explain the working of a Zener diode in forward bias and reverse bias V-I characteristics.	13	K2	CO1
12.	a)	Explain Integrator with neat sketch.	13	K2	CO2
		OR			
	b)	Explain We in Bridge oscillator with neat sketch and derive its frequency conditions.	13	K2	CO2
13. a)	i)	Explain in detail about R/2R type DAC module.	7	K2	CO3
	ii)	Explain in detail about weighted resistor type DAC module.	6	K2	CO3
		OR			

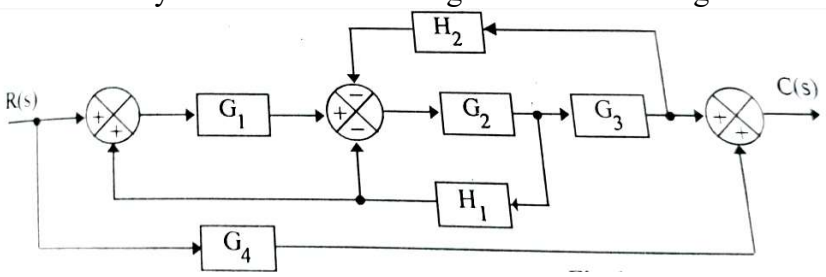
b) Enumerate the need for ADC with a practical example. Explain ADC and its types with neat diagram. *13 K2 CO3*

14. a) Compute the differential equations governing the mechanical system shown in fig. and determine the transfer function. *13 K3 CO4*



OR

b) Using block diagram reduction technique find closed loop transfer function of the system whose block diagram is shown in fig. *13 K3 CO4*



15. a) Obtain the response of unity feedback system whose open loop transfer function is G(s) = 4/s(s+5) and when the input is unit step. *13 K2 CO5*

OR

b) Derive the response of critically damped second order system for unit step input. *13 K2 CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Calculate the overall gain C(s)/R(s) for the signal flow graph shown in fig.1 *15 K3 CO4*

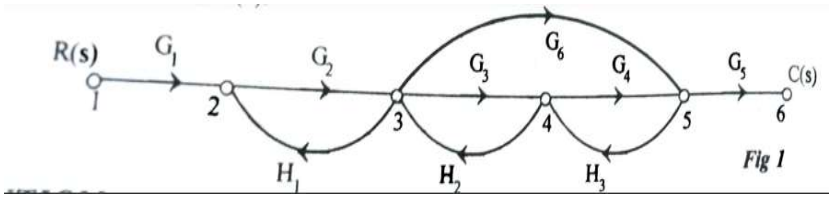


Fig 1

OR

b) Derive the response of under damped second order system for unit step input. *15 K3 CO5*