Enrollm	ent N	No:	Exam Seat No:		
	CIIC I		UNIVERSITY		
		Summer Exa	mination-2020		
Subject 1	Nam	e : Linear Control Theory			
Subject Code: 4TE05LCT1		e: 4TE05LCT1	Branch: B.Tech (Electrical)		
Semester	r : 5	Date: 28/02/2020	Time: 10:30 To 01:30	Marks: 70	
(2) I (3) I	Use o Instru Draw	of Programmable calculator & any actions written on main answer be neat diagrams and figures (if neame suitable data if needed.	ook are strictly to be obeyed.	prohibited.	
Q-1		Attempt the following questions	:	(14)	
	a)	The objective of control system a system. (True/False)	study is to check the stable oper	ration of	
	b)	The transfer function block G(s) (True/False)	represent the gain of a given sy	rstem.	
	c)	The transfer function block H(s) control system. (True/False)	represent the feedback gain of	a given	
	d)	The fan operation is an example (Open, Close, Infinite loop, Nor	± • •		
	e)	The block diagram reduction tec function. (simplification, amplific	hnique is used for of tra	nnsfer	
	f)	State the name of formulae whic graph.		low	
	g)	The time response analysis is use control system. (Steady, Transier		of a	
	h)	The term Tp represents the time is reached. (True/False)		e system	
	i)	The bode plot of a system is used with different frequency. (True/F		a system	
	j)	State the name of criterion used system.	· ·	f a	
	k)	The root locus system determine (True/False)	s the gain of a given system.		
	1)	If all the roots of a given transfe	er function are in the right half o	f a plane	



n) The guided missile is an example of a loop control system. (Close,

the given system is stable. (True/False)
m) What is the use of Nyquist Criterion?

Open, Infinite, None)

Attempt any four questions from Q-2 to Q-8

Q-2	(a)	Attempt all questions State the comparison between open loop control system and close loop	(14) (7)
	(b)	control system. What is transfer function? Derive the transfer function of a closed loop control system with usual notations.	(7)
0.2		Attampt all quastions	(14)
Q-3	(a)	Attempt all questions What is Laplace transform? Why do we use laplace transform in control system. Provide the inverse laplace transform of the following functions: (1) 1/2 (2) 1/2 (3) 1/2 (2)	
	(b)	: (1) 1/s (2) 1/s+a (3) 1/s-a Explain any four rules of block diagram reduction technique.	(8)
Q-4	(a)	Attempt all questions Derive the transfer function of the following block diagram systems. R(s) G1 C(s)	(14) (7)
		Fig (a) R(s) G1 G2 C(s) R(s) Fig (c) H H	
	(b)	Explain the force-voltage and force-current analogy with relative differences and similarities.	(7)
Q-5	(a) (b)	Attempt all questions Explain the solution steps /rules for signal flow graph. Find the transfer function for the block diagram shown in fig. (d) below using signal flow graph solution technique. R(s) G3 G4 G5 G6	(14) (7) (7)
Q-6	(a) (b)	Attempt all questions $s^6+2s^5+8s^4+12s^3+20s^2+16s+16=0$ check the stability of the given characteristic equation using Routh's method. Define the following term: (1)Peak overshoot (2) Peak time (3) Rise Time (4)Delay time (5) Steady state error (6) Transient Response(7) Steady state response	(14) (7) (7)
Q-7	(a)	Attempt all questions Define controllability and observability for single input single output	(14) (7) Page 2 of 3

	(b)	system. Derive the root locus for the system having the function $G(s)H(s)=K(S+5)/S(S^2+2S+1)$	(7)
Q-8		Attempt all questions	(14)
	(a)	Explain gain margin and phase margin for the case of bode plot.	(7)
	(b)	Draw the polar plot for the system $G(s)=1/s(Ts+1)$	(7)

