

Department of Electronics & Communication Engineering

QUESTION BANK

Course Title	CONTROL SYSTEMS ENGINEERING			
Course Code	A50217			
Regulation	R13			
Course Structure	Lectures	Tutorials	Practicals	Credits
	4	1	-	4
Course Coordinator	J.UMA MAHESHWAR			
Team of Instructors	M.VISWANATH,A	.SAI KUMAR ,J.UMA	MAHESHWAR	

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Marri Laxman Reddy Institute of Technology and Management, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

COURSE OUTCOMES:

A: After going through this course the student gets a thorough knowledge on open loop and closed loop control systems, concept of feedback in control systems.

B: Mathematical modeling and transfer function derivations of Synchros, AC and DC servo motors, Transfer function representation through block diagram algebra can be understood.

C: Signal flow graphs, time response analysis of different ordered systems through their characteristic equation and time domain specifications can be learned

D: Stability analysis of control systems in S-domain through R-H criteria and root locus techniques, frequency response analysis through bode diagrams

E: Nyquist, polar plots and the basics of state space analysis

F: Design of PID controllers with which he/she can able to apply the above conceptual things to real-world electrical and electronics problems and applications

G: Design of lag, lead, lag-lead compensators, with which he/she can able to apply the above conceptual things to real-world electrical and electronics problems and applications.

PROGRAMME OUTCOMES

List the Course Outcomes (COs) and Program Outcomes (POs) (2) (List the course outcomes of the courses in program curriculum and program outcomes of the program under accreditation)

The Electronics and communication Engineering Department Faculty, students, and industry advisory board have adopted the Engineering Criteria outcomes and have defined specific outcomes to be achieved by the Electronics and communication engineering students. These outcomes are:

- a) An ability to apply knowledge of Science, Mathematics, Engineering & Computing fundamentals for the solutions of Complex Engineering problems.
- b) An ability to identify, formulates, research literature and analyze complex engineering problems using first principles of mathematics and engineering sciences.
- c) An ability to design solutions to complex process or program to meet desired needs
- d) Ability to use research-based knowledge and research methods including design of experiments to provide valid conclusions.
- e) An ability to use appropriate techniques, skills and tools necessary for computing practice.
- f) Ability to apply reasoning informed by the contextual knowledge to assess social issues, consequences & responsibilities relevant to the professional engineering practice.
- g) Ability to understand the impact of engineering solutions in a global, economic, environmental, and societal context with sustainability.
- h) An understanding of professional, ethical, Social issues and responsibilities.
- i) An ability to function as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
- j) An ability to communicate effectively on complex engineering activities within the engineering community.
- k) Ability to demonstrate and understanding of the engineering and management principles as a member and leader in a team.
- 1) Ability to engage in independent and lifelong learning in the context of technological change.

S.	QUESTION	Blooms	Course	Progra
No		Taxonomy	Outco	m
		Level	me	outco
				mes
UNIT-I				
1.	Classify control systems based on Hierarchy	Remember	А	а

GROUP - A (SHORT ANSWER QUESTIONS)

S.	QUESTION	Blooms	Course	Progra
No		Taxonomy	Outco	m
		Level	me	outco
				mes
2.	How feedback control systems are classified	Evaluate	А	а
3.	Define (i) system (ii)contol system	Evaluate	А	а
4.	Distinguish between linear and non-linear control systems	Remember	А	а
5.	Compare open loop and closed loop control systems	Remember	А	а
6.	Discuss the effect of feedback on stability	Understand	А	а
7.	Discuss the effect of feedback on over all gain	Understand	А	b
8.	Discuss the effect of feedback on over sensitivity	Understand	А	b
9.	istinguish between continuous data and discrete data control systems	Evaluate	А	С
10.	Define transmittance, sink and source nodes of signal flow graph.	Understand	А	а
11	Write force balanced equations for ideal mass element and spring	Understand	В	b
12		Remember	В	с
	Explain about the masons gain formula			
13			С	с
		Understand		
	Define open path, closed path, forward path			
14		Remember	С	а
	Write any three rules with respect to signal flow algebra.			
15	Write the torque balanced equation for ideal rotational mass element dash	Evaluate	В	b
	pot			
16			В	С
		Understand		
	What is block diagram ? what are the basic components of block diagram			
17	Write the rule for eliminating negative feedback.	Understand	В	d
18	What are the basic properties of signal flow graph	Evaluate	С	е
19	What are the components of feedback control system	Evaluate	А	f
20	What are the characteristics of feedback	Analyze	А	а
21	Explain open loop & closed loop control systems by giving suitable	Remember	А	а
	Examples & also highlights their merits & demerits.			
22			А	b
		Understand		
	Define transmittance, sink and source?			
23	Explain the traffic control systems using open loop and closed loop	Remember	А	С
	systems?			
24	Explain the temperature control system using open loop and closed	Evaluate	А	d
	loop systems?			
25			•	
25		L lus al a masta na al	А	a
	Human being is an example of closed loop system. Justify your	Understand		
20	answer?		6	
20	How do you construct a signal flow graph from the equations?			e d
2/	List auvantages of signal now graph over block diagram?	Evaluate		u
28	Illustrate at least three applications of feedback control systems?	Evaluate	Α	h
29	Explain the advantages of systems with feedback? what	Analyze	Δ	h
	are the effects of feedback On the performance of a system? Briefly	, undry 20		~
1	are the checks of recasador on the performance of a system; Difelly	1	1	

S. No	QUESTION explain?	Blooms Taxonomy Level	Course Outco me	Progra m outco mes
30	Explain open loop & closed loop control systems by giving suitable Examples & also highlights their merits & demerits.	Analyze	A	b
		<u> </u>	<u> </u>	
1.	Explain the rules of block diagram reduction algebra	Understand		С
2.	Determine the transfer function c(s)/r(s)	Remember	В	C
3.	Determine the transfer function for the given block diagram	Understand	В	d
4.	For the signal flow graph find transfer function H_2 G_1 G_1 G_2 G_3 G_4 G_5 G_4 G_5 G_5 G_4 G_5 G_5 G_4 G_5 G_5 G_4 G_5 G_5 G_6 G_6 G_6 G_6 G_6 G_6 G_6 G_7 G_7 G_7 G_7 G_8 G_8 G_8 G_9	Remember	С	d
5.	Apply masons gain formula to find its transfer function	Evaluate	С	E

S.	QUESTION	Blooms	Course	Progra
No		Taxonomy	Outco	m
		Level	me	outco
				mes
	0 G1 G2 G3 G4 G4			
	-H2 Gib -H3			
6.	For the given mechanical system find its transfer function y2(s)/f(s)	Understand	В	С
	succept			
	× 3 H B			
	MI J.S.			
	3 4			
	M2 JIJ2			
7.	For the given electrical circuit find transfer function v2(s)/e(s)	Understand	В	d
	R, Ru			
	$et = c_1 + T = c_2 v_2 t_1$			
8.	For the mechanical rotational system find the transfer function	Evaluate	В	f
	1 = - 682			
	A J J J J J J D BN			
	TOX			
	s state to to to			
9.	Find transfer function $x(s)/f(s)$	Evaluate	В	t
	M1 M2 f			
	B1 B2-			
10.	Classify the control systems?	Analyze	А	f

S.	QUESTION	Blooms	Course	Progra
No		Taxonomy	Outco	m
		Level	me	outco
				mes
11.	With an example explain about open loop control systems	Understand	Α	а
12	With an example explain about closed loop control systems	Remember	А	а
13	Explain about the various terms involved in signal flow graph also		С	а
	explain about the properties of signal flow graph	Understand		
14	Explain the differences between block diagram reduction and signal	Remember	C	h
- '	flow graph technique	nemeniber	C	~
15	Explain the procedure to construct a signal flow graph and also	Evaluate	С	b
	explain its advantages over block diagram reduction technique			
16	Find the transfer function Theta(s)/t(s).		В	с
		Understand		
	they -			
	0 1 - 60002 J2 1			
	JI LOT			
	ſ			
	E T			
	T			
17	For the electrical network shown below find transfer function	Understand	В	d
	i2(s)/ei(s)			
	R AND			
	TCITC			
	en) l / s l			
	US, 22			
	0			
18	What do you mean by a closed loop system Silustify your answer by	Evaluato	^	2
10	considering temperature control system as an example	Lvaluate		a
19	Write down the force balanced equations for any three elements of	Evaluate	В	f
	mechanical translational systems			
20	Write down the force balanced equations for any three elements of	Analyze	В	F
	mechanical rotational systems			
	UNIT-II			
1	SHORT ANSWER QUESTIONS			
1. 2	Explain about P-Controller.	Remember	C	
2. 3.	Discuss the Drawbacks with respect to P-Controller.I-	Understand	c	c
	Controller		-	
4.	What do you mean by P-I-D controller	Remember	C	с
5.	Define Rise time	Evaluate	C	С

S.	QUESTION	Blooms	Course	Progra
No		Taxonomy	Outco	m
		Level	me	outco
			6	mes
6.	Define Settling time	Understand	C	d
/.	Explain about (1) step signal (11)Ramp signal	Understand	C	d
8.	Explain about (1) impulse (11)parabolic signal	Evaluate	C	d
9.	With an expression explain about peak over shoot	Evaluate	C	a
10.	What are type-0 systems?	Analyze	C	e
12	what are type-1 systems?	Domombor		e
12	What are type 2 systems?	Remember	C	е
12	what are type-2 systems?		C	0
12		Understand	C	e
	What does the term "type" of a system indicate	Onderstand		
14	what does the term type of a system indicate	Remember	C	۵
14	Write down the expressions for static error coefficients	Remember		C
15		Evaluate	С	е
	What do you mean by time response of a control system			
16			С	е
		Understand		
	What does the term "order" of a system indicate			
17	Define damping ratio. how the system is classified depending	Understand	С	а
	on the value of the system		-	
18	(i) $G(S)=40/S(s+2)(s+3)(s+4)$	Evaluate	C	а
19	Find the type and order of the system	Evaluate	С	а
	(i)G(S)=40/S(s+4)(s+5)(s+2)			
20	Find the value of velocity error coefficient for a system with	Analyze	С	b
	(i)G(S)=40/S(s+4)(s+5)(s+2)			
21	What are the test signals?	Understand	с	b
22	What is the time response of the first order system for unit	Remember	C	° b
	impulse input?		•	~
23	What is the time response of the first order system for unit step	Understand	С	b
	Input?? What is the time recording of the first order system for unit	D	6	1.
24	ramp input?	Remember	C	a
25	What is the time response of the first order system for unit	Evaluate	С	с
	parabolic input??		_	_
26	Define Damping ratio. How the system is classified depending	Understand	С	С
	on the value of damping?			
27	Derive the transient response of over damped second order	Understand	С	с
	system when excited by unit step input?			
20	Derive the transient response of critically derived and the		<u> </u>	
28	Derive the transient response of critically damped second order	Evaluate		C
20	Define maximum peak exercises to at 2	Evaluata	C	4
29	Define Inaximum peak oversnoot?			u d
50		Analyze		u
	LONG ANSWER QUESTIONS	1	1	
1.	Explain about various test signal used in control systems also write	Remember	С	b

S.	QUESTION	Blooms	Course	Progra
No		Taxonomy	Outco	m
		Level	me	outco
				mes
	down their Laplace transform equivalents			
2.	Find the response of unity feedback first order system for unit step	Understand	С	е
	input			
3.	Find the response of unity feedback first order system for unit ramp	Understand	С	e
	input			
4.	Find the response of unity feedback second order system for unit	Evaluate	С	e
	step input			
5.	Find the response of unity feedback second order system for unit	Evaluate	С	e
	ramp input		_	
6.	Explain about all the time domain specifications along with their	Evaluate	С	а
_	formula			
7.	Explain about P-I controller.	Understand	C	а
8.	Explain about P-I-D controller.	Evaluate	C	а
9.	Find the response of a system with g(s)=100/s(s+2) and H(s)=0.1s+1	Evaluate	С	b
10	when the input applied is unit step			
10.	Obtain the response of the unity feedback system whose open loop	Analyze	C	b
	transfer function is g(s)=4/s(s+5)		6	1.
11	Explain about error constants KP,KV and Ka	Understand	C	D
12	what are the advantages and disadvantages of	Remember	C	D
	propretional, proporstional derivative, proportional integral control			
12	sytems		6	la la
13	A unity feedback system has an open loop transfer function $r(s) = 10 (r(s+2))$ find the rise time, percentees everybact and neels		C	a
	g(S)=10/S(S+2) find the rise time, percentage overshoot and peak	Understand		
14	A system is excited by unit ramp input its closed transfer function is	Bomomhor	C	<u> </u>
14	A system is excluded by unit famp input its closed transfer function is $20/s(s+10)(s+20)$ find its output in time domain	Kennennber	L	L
15	Derive the transient response of un damped second order system	Evaluato	C	h
15	when excited by unit step input	LValuate	C	D D
16	Sketch the output response when a system with transfer function		C	h
10	1/(1+20s) is excited by a step input of 10	Understand	C	5
		onderstand		
17	Find the steady state error when the input is unit step for atype-0	Understand	С	b
	and type-1 systems		C .	~
18	Find the steady state error when the input is unit ramp for atype-0	Evaluate	С	b
	and type-1 systems		-	
19	A system is excited by unit ramp input its closed transfer function is	Evaluate	С	b
	12/s(s+1)(s+2)(s+3) find its output in time domain		-	
20	Derive the expression for time domain specification of a under	Analyze	С	с
	damped second order system to a step input			

UNIT-III			
SHORT ANSWER QUESTIONS			
	Blooms	Course	Program
	Taxonomy	Outcome	outcomes

		Level		
1.	Define Stability	Understand	D	е
2.	Explain about impulse response of the system	Remember	D	е
3.	What do you understand from the term BIBO stability	Understand	D	е
4.	Locate the poles and zeros on the S-plane of a system	Remember	D	а
	G(s)=10(s+2)(s+3)/(s+4)(s-6)(s+7)			
5.	Locate the poles and zeros on the S-plane of a system	Evaluate	D	а
	G(s)=10(s+2)(s+3)/(s+4)(s-6)(s+7)			
6.	Define routh's stability criterion	Understand	D	a
7.	What is root locus?	Understand	D	b
8.	What is the necessary and sufficient condition for stability according to rouths stability criteria	Evaluate	D	b
9.	What is characteristic equation	Evaluate	D	b
10.	Locate the poles and zeros on the S-plane of a system	Analyze	D	b
	$G(s)=13(s+7)(s+9)/(s^2+5s+8)$			
11	What is meant by root locus.	Understand	D	b
12	What is the magnitude criterion of root locus	Remember	D	f
13	What is centroid.how it is calculated.	Understand	D	f
14	What are asymptotes. How to find the angle of asymptote.	Remember	D	f
15	How to find the crossing point of root locus on imaginary axis.	Evaluate	D	f
16	What is meant by Breakaway point and Break in point.	Understand	D	f
17	How to find crossing point on imaginary axis.	Understand	D	f
18	How to find root locus on imaginary axis.	Remember	D	d
19	How to find the value of K at any point on the root locus.	Understand	D	d

20	Write the formula for Angle of departure and angle of arrival.	Remember	D	а
21	Define Absolute stability ?	Evaluate	D	а
22	Define marginal stability	Understand	D	a
23	Define conditional stability	Understand	D	а
24	Define stable system	Remember	D	а
25	Define Critically stable system	Understand	D	
26	Define conditionally stable system?	Remember	D	а
27	State Routh's stability criterion. State their advantages	Evaluate	D	С
28	State Routh's stability criterion. State their advantages	Understand	D	b
29	What are the limitations of Routh Hurwitz criteria?	Evaluate	D	f
30	what are the necessary conditions to have all the roots of characteristics equation in the left half of s-plane?	Evaluate	D	b
		1		
1.	Based on the location of poles on the s-plane and its corresponding impulse response discuss about various conditions for stability	Understand		е
2.	Explain about R-H criterion for finding the stability of a system	Remember	D	е
3.	Explain about the various steps involved in constructing the Rouths array	Understand	D	е
4.	Using the routh's criterion determine the stability of the system represented by characteristic equation s ⁴ +8s ³ +18s ² +16s+5=0	Remember	D	а
5.	Using the routh's criterion determine the stability of the system represented by characteristic equation $s^6+2s^5+8s^4+12s^3+20s^2+16=0$ also determine the roots lying on the right half of the s-plane	Evaluate	D	а
6.	Using the routh's criterion determine the stability of the system represented by characteristic equation s ⁵ +s ⁴ +2s ³ +2s ² +3s+5=0 also determine the roots lying on the right half of the s-plane	Understand	D	а
7.	Construct the routh array for the unity feedback system g(s)=10/s(s+2)(s+6)(s+7)	Understand	D	b
8.	Using the routh's criterion determine the stability of the system represented by characteristic equation $s^7+9s^6+24s^5+24s^3+24s^2+23s+15$	Evaluate	D	b
9.	State the advantages and limitations of R-H criteria	Evaluate	D	b
10	Construct the routh array for the unity feedback system	Analyze	D	b

	g(s)=k/s(s+2)(s+4)(s ² +6s+25) find the value for Kc			
11	Write the rules for construction of root locus.	Understand	D	b
12	Write the procedure for construction of root locus.	Remember	D	е
13	A unity feed back system has an open loop transfer function	Understand	D	е
	$G(s)=k/s(s^2+4S+13).$			
	Sketch the root locus			
14	sketch the root locus of the unity feed back system whose	Remember	D	е
	open loop transfer function is G(s)=k/s(s+2)(s+4).			
15	A unity feed back system has an open loop transfer function	Evaluate	D	а
	G(s)=k(s+9)/s(s ² +4S+11).			
	Clusted the rest large			
	Sketch the root locus.			
16	Sketch the root locus of the unity feed back system whose		D	а
	open loop transfer function is G(s)=k/s(s+4)(s ² +4S+20).	Understand		
17	sketch the root locus of the unity feed back system whose		D	а
	open loop transfer function is G(s)=k(s+1.5)/s(s+1)(s+5).	Understand		
18	sketch the root locus of the unity feed back system whose	Understand	D	b
	open loop transfer function is G(s)=k(s ² +6s+25)/s(s+1)(s+2).			
10			-	
19	sketch the root locus of the unity feed back system whose	Remember	D	D
	open loop transfer function is G(s)=k/s(s ² +6s+10).			
20	what will be the effect for root locus if we add poles and zeros	Understand	D	b
	to G(s)H(s).			

UNIT-III SHORT ANSWER QUESTIONS			
	Blooms	Course	Program
	Taxonomy	Outcome	outcomes
	Level		

1.	Define Stability	Understand	D	е
2.	Explain about impulse response of the system	Remember	D	е
3.	What do you understand from the term BIBO stability	Understand	D	е
4.	Locate the poles and zeros on the S-plane of a system	Remember	D	а
	G(s)=10(s+2)(s+3)/(s+4)(s-6)(s+7)			
5.	Locate the poles and zeros on the S-plane of a system	Evaluate	D	а
	G(s)=10(s+2)(s+3)/(s+4)(s-6)(s+7)			
6.	Define routh's stability criterion	Understand	D	a
7.	What is root locus?	Understand	D	b
8.	What is the necessary and sufficient condition for stability according to rouths stability criteria	Evaluate	D	b
9.	What is characteristic equation	Evaluate	D	b
10.	Locate the poles and zeros on the S-plane of a system	Analyze	D	b
	$G(s)=13(s+7)(s+9)/(s^2+5s+8)$			
11	What is meant by root locus.	Understand	D	b
12	What is the magnitude criterion of root locus	Remember	D	е
13	What is centroid.how it is calculated.	Understand	D	е
14	What are asymptotes. How to find the angle of asymptote.	Remember	D	е
15	How to find the crossing point of root locus on imaginary axis.	Evaluate	D	а
16	What is meant by Breakaway point and Break in point.	Understand	D	а
17	How to find crossing point on imaginary axis.	Understand	D	а
18	How to find root locus on imaginary axis.	Remember	D	b
19	How to find the value of K at any point on the root locus.	Understand	D	b
20	Write the formula for Angle of departure and angle of arrival.	Remember	D	b

21	Define Absolute stability ?	Evaluate	D	b
22	Define marginal stability	Understand	D	b
23	Define conditional stability	Understand	D	а
24	Define stable system	Remember	D	С
25	Define Critically stable system	Understand	D	b
26	Define conditionally stable system?	Remember	D	d
27	State Routh's stability criterion. State their advantages	Evaluate	D	е
28	State Routh's stability criterion. State their advantages	Understand	D	d
29	What are the limitations of Routh Hurwitz criteria?	Evaluate	D	С
30	what are the necessary conditions to have all the roots of characteristics equation in the left half of s-plane?	Evaluate	D	а
1.	Explain the term compensator and what are the different types of compensators are there.	Understand	D	a
2.	Realize the lag compensator using electrical network and write the frequency response of lag compensator.	Remember	F	а
3.	Realize the lead compensator using electrical network and write the frequency response of lag compensator.	Understand	F	a
4.	Realize the lag lead compensator using electrical network and write the frequency response of lag compensator.	Remember	F	a
5.	Write the procedure for design of Lag compensator using bode plot.	Evaluate	F	a
6.	Write the procedure for design of Lead compensator using	Understand	F	С
	bode plot.			
7.	Write the procedure for design of Lag lead compensator using bode polot.	Understand	F	с

9.	Draw the Bode plot for $G(s)=1/(1+sT)$.	Evaluate	D	с
10.	Draw the Bode plot for G(s)=(1+sT).	Analyze	D	b
11	Write the procedure for Magntude and Phase plot for Bode plot.	Understand	D	b
12	Sketch the Bode plot for the following Transfer function G(S)=s ² /(1+0.2s)(1+0.02s)	Remember	D	b
13	Sketch the Bode plot for the following Transfer function G(S)=10/s(1+0.4s)(1+0.1s).	Understand	D	С
14	Using Bode plot find gain and phase cross over frequency for G(S)=10/s(1+0.4s)(1+0.1s).	Remember	D	с
15	For the following Transfer function draw the Bode plot and obtain gain cross over frequency G(s)=20/s(1+3s)(1+4s).	Evaluate	D	e
16	for the function G(s)=5(1+2s)/(1+4s)(1+0.25s). Draw the bode plot	Understand	D	е
17	The open loop Transfer function of a unity feed back system is G(s)=1/s(1+s)(1+2s). Sketch the polar plot and determine gain margin and phase margin.	Understand	D	е
18	Derive the formulae for Resonant peak and resonant frequency	Understand	D	а
19	The open loop Transfer function of a unity feed back system is $G(s)=1/s^2(1+s)(1+2s)$. Sketch the polar plot and determine gain margin and phase margin.	Remember	D	С
20	Derive the formulae for Bandwidth and phase margin	Understand	D	C
	UNIT-IV			
	SHORT ANSWER QUESTIONS			
1.	Define the terms Resonant peak and resonant frequency	Understand	D	

2.	Define the term Bandwidth.	Remember	D	е
3.	Explain the term Gain margin	Understand	D	е
4.	Explain the term phase margin.	Remember	D	е
5.	what is Bode plot	Evaluate	D	а
6.	Define corner frequency.	Understand	D	а
7.	What is polar plot.	Understand	D	а
8.	What are the advantages of Bode plot.	Evaluate	D	b
9.	What is cut off rate.	Evaluate	D	b
10.	what are the frequency domain specifications.	Analyze	D	b
11	what is meant by compensation	Understand	D	b
12	what is a lag compensator and draw the electrical network for	Remember	F	b
	it.			
13	what is a lag lead compensator and draw the electrical network for it.	Understand	F	е
14	write the transfer function for lead compensator and draw the pole-zero plot for it.	Remember	F	е
15	write the transfer function for lag compensator and draw the pole-zero plot for it.	Evaluate	F	e
16	write the transfer function for lag lead compensator and draw the pole-zero plot for it.	Understand	F	а
17	Write the transfer function of PID controller.	Understand	F	а
18	Write the Nyqusit criteria.	Remember	E	а
19	Define the terms Resonant peak and resonant frequency	Understand	D	b
20	Write the formula for Bandwidth.	Remember	D	b
21	What are frequency domain specifications?	Evaluate	D	b
22	What is frequency response?	Understand	D	b

23	What are advantages of frequency response analysis?	Understand	D	b
24	Explain the steps for the construction of Bode plot?	Remember	D	d
25	What are the advantages of Bode Plot?	Understand	D	d
26	Explain with the examples Of minimum phase function	Remember	D	d
27	Explain with the examples Of non-minimum phase function	Evaluate	D	d
28	Explain with the examples Of all pass transfer function	Understand	D	С
29	What is the drawback in P-controller?	Evaluate	F	с
30	What are the advantages of Bode Plot and polar plots?	Evaluate	D	С
1.	obtain the state model of the linear network as shown in figure.	Understand	D	e
2.	obtain the state model of the linear network as shown in figure.	Remember	D	e

	etter jat,			
3.	obtain the state model of the linear network as shown in figure.	Understand	D	e
4.	obtain the state model of the linear network as shown in figure $\frac{1}{2}$	Remember	D	а
5.	obtain the state variable representation of the armature_controlled DC motor as shown in fig.	Evaluate	F	a
6.	obtain the state variable representation of the field controlled DC motor as shown in fig	Understand	F	а

	+ T M La Constrant ef D F B B V ef J J Field Gatsouled Dc matus.			
7.	obtain the state model of the mechanical system as shown in fig	Understand	В	b
8.	Explain the terms state vector and state space and Transfer function of a state model.	Evaluate	D	b
9.	obtain the state model of the mechanical system as shown in fig $ \begin{array}{c} $	Evaluate	В	b
10.	obtain the state model of the system described by $T(s)=Y(s)/U(s)= 1/(s^3+6s^2+10s+5)$	Analyze	В	b
11	obtain the state model of the system described by T(s)=Y(s)/U(s)= $5/(s^3+6s+7)$	Understand	D	b
12	obtain the state model of the system described by T(s)=Y(s)/U(s)=(s^2+3s+4)/(s^3+2s^2+3s+2)	Remember	D	а

13	obtain the state model of the system described by	Understand	D	b
	T(s)=Y(s)/U(s)=(2s ³ +7s ² +12s+8)/(s ³ +6s ² +11s+9)			
14	Diagonalize the system matrix given as	Remember	D	b
	A=[0 1 0; 0 0 1; -6 -11 -6] _{3x3}			
15	Diagonalize the system matrix given as B= $\begin{bmatrix} 0 & 1 & 0 & 0 & 1 \end{bmatrix}$; -2, -5, -4] _{2×2}	Evaluate	D	b
16	obtain the STM for the state model whose matrix A is given by		D	b
	с, ,	Understand		
	$A=[1 \ 1; 0 \ 1]_{2\times 2}$			
17	obtain the STM for the state model whose matrix A is given by		D	b
		Understand		
	$A = [0 \ 1; -1 \ -2]_{2x2}$			
18	obtain the STM for the state model whose matrix A is given by	Understand	D	С
	$A=[0 \ 1: -2 \ -3]_{2\times 2}$			
19	write the differences between Transfer function approach and	Remember	D	С
20	state variable approach			
20	Derive the formula for transfer function of a state model	Understand	D	С
			L _	
1.	Define the term state variables	Understand	D	e
2.	Define the term state space.	Remember	D	е
3.	What is the state model of a single input single output linear		D	е
	system.	Understand		
	System			
4.	. Define the term state vector.	Remember	D	а
5.	Define the term state.	Evaluate	D	а
<u> </u>				
б.	what is the significance of State transition matrix.	Understand	ט	d

8.	why e ^{At} is known state transistion matrix.	Evaluate	D	b
9.	How do you obtain characteristic equation of a system from its state model.	Evaluate	D	b
10.	what is meant by homogeneous and non homogeneous state equation	Analyze	D	b
11	How can you determine the order of the system from its state model.	Understand	D	b
12	In the state model equations what are the dimensions of x(t),y(t),A,B,C,D	Remember	D	е
13	In state space analysis what are the different types of variables are involved.	Understand	D	е
14	Write the formula for transfer function of a state model	Remember	D	е
15	Define the term controllability	Evaluate	D	а
16	Define the term observability.	Understand	D	a
17	Define the term state vector.	Understand	D	а
18	Draw the Block diagram representation of state model of the system.	Remember	D	b
19	How to calculate the modal matrix and diagonal matrix.	Understand	D	b
20	Is the state model of the system is unique.	Remember	D	b
21	What are Eigen values?	Evaluate	D	b

22	Write any two properties of state transition matrix?	Understand	D	b
23	Write short notes on canonical form of representation .list its advantages and disadvantages?	Understand	D	е
24	Write shot notes on formulation of state equations?	Remember	D	е
25	Write short notes on canonical form of representation .list its advantages?	Understand	D	е
26	Write short notes on canonical form of representation ?List its Dis- advantages	Remember	D	а
27	Writ differences between observability and controllability?	Evaluate	D	а
28	Write state model approach?Give two advantages?	Understand	D	a
29	Write transfer function of a state model?Give two advantages?	Evaluate	D	b
30	Write canonical form of representation?Give two advantages?	Evaluate	D	b

