INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal, Hyderabad - 500 043

ELECTRICAL AND ELECTRONICS ENGINEERING

ASSIGNMENT

Course Name	:	**PRINCIPLES OF ELECTRICAL ENGINEERING**
Course Code	:	**A40215**
Class	:	II B. Tech II Semester
Branch	:	Electrical and communication Engineering
Year	:	2016 – 2017
Course Faculty	:	A. Naresh Kumar, P. Shiva Kumar, Lekha Chandran, Assistant Professor

OBJECTIVES

This course it is aimed to introduce the students the principles and applications of control systems in everyday life. The basic concepts of block diagram reduction, time analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

S. No	Question	Blooms Taxonomy Level	Course Outcome
	ASSIGNMENT I **UNIT – I** **SHORT ANSWER QUESTIONS**		
1	Define I) Rise time II) Peak time	Understand	1
2	Define I) Delay time II) Peak over shoot III) Settling time	Understand	1
3	Write expression for transient response of Series R-L circuit?	Understand	1
4	Write expression for transient response of Series R-C circuit?	Remember	1
5	Write expression for transient response of Series R-L-C circuit?	Remember	1
	DISCRIPTIVE ANSWER QUESTIONS		
1.	Obtain the expression for current i(t) for t>0 in a driven series R-L circuit with dc excitation. Hence obtain expression for vl(t).	Understand	1
2.	Derive the expression for current i(t) for t>0 in a un driven series R-L circuit. Draw necessary sketches. Assume D.C excitation.	Remember	1
3.	Obtain transient response of source free series R-C circuit?	Remember	1
4.	Obtain transient response of source free series R-L circuit?	Remember	1
5.	Obtain transient response of source free series R-L-C circuit?	Remember	1
	ANALYTICAL ANSWER QUESTIONS		
1.	In the network shown in figure, switch k is closed at t=0 with the capacitor uncharged .Find the values of $i, di/dt, d^2i/dt^2$ at t=0+,for elements values as follows ; V=100v,R=1000ohms ,c=1µf	Apply	1
2.	The switch is closed at t=0. Find values of $i, di/dt, d^2i/dt^2$,at t=0+ assume initial current of to be zero.	Apply	1

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3.	In the networks shown in figure switch K is closed and a steady state is reached in the network. at t=0,the switch is opened .find an expression for the current in the inductor ,i2(t).	Apply	1
4.	Find out the Laplace transform of f(t)=e-at for t≥0.	Apply	1
5.	Find the Laplace transform of damped sine and cosine functions i.e 1)e-atsinwt 2) e-at coswt.	Apply	1
	ASSIGNMENT II **UNIT - II** **SHORT ANSWER QUESTIONS**		
1.	Obtain Y parameters in terms of Z parameters.	Evaluate& Remember	2
2.	Obtain Y parameters in terms of hybrid parameters.	Evaluate& Remember	2
3.	Obtain Y parameters in terms of transmission parameters.	Evaluate& Remember	2
4.	Obtain H parameters in terms of transmission parameters.	Evaluate& Remember	2
5.	Write the formulas for image impedance of two port networks	Analyze	2
	DISCRIPTIVE ANSWER QUESTIONS		
1.	Derive condition of symmetry for transmission parameters.	Creating &analyze	2
2.	Derive condition of reciprocity for z parameters.	Evaluate	2
3.	Derive condition of reciprocity for Y parameters.	Evaluate	2
4.	Derive condition of reciprocity for H parameters.	Analyses	2
5.	Derive condition of reciprocity for ABCD parameters		
	ANALYTICAL ANSWER QUESTIONS		
1.	The parameters of two port network are Z11=20ohms,Z22 =30	Creating &analyse	2

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	ohms,Z12=Z21=10ohm find Y and ABCD parameters of the net work		
2.	Find the z-parameters for the network shown in figure	Evaluate	2
3.	Using definitions, find y-parameters of the two port network shown in figure	Evaluate	2
4.	Find the transmission parameters for the network shown in figure.	Analyze	2
5.	Two networks have been shown in fig. Obtain the transmission parameters of the resulting circuit when both the circuits are in cascade.	Analyze	2
	ASSIGNMENT III **UNIT – III** **SHORT ANSWER QUESTIONS**		
1.	What is proto type section?	analyze	3
2.	Sketch reactance versus frequency curves of low pass constant k-filter?	Understand	3
3.	What are attenuators?	analyze	3
4.	Write expression for symmetrical t-attenuator?	evaluate	3
5.	Write expression for pi attenuator	evaluate	3
	DISCRIPTIVE ANSWER QUESTIONS		
1.	Describe a proto type t section band stop filter. Determine the formula for designing band pass filter?	Creating &analyze	3
2.	Derive expression for symmetrical t-attenuator	Evaluate	3
3.	Obtain design equations for bridged t-type attenuator	Evaluate	3
4.	Define decibel and neper units. How are they related to each other derive the expression for the same	Analyse	3
5.	Derive design equations of lattice type symmetrical attenuator?	Evaluate	3
	ANALYTICAL ANSWER QUESTIONS		
1.	Design a band pass filter having a design impedance of 400 ohms and cut off frequencies of 2khz and 8khz	Creating &analyze	3
2.	Design a band elimination filter having a design impedance of 500 ohms and cut off frequencies of f1=1khz and f2=6khz	Evaluate	3
3.	Design a low pass filter having cut-off frequencies 2khz to perate	Evaluate	3

S. No	Question	Blooms Taxonomy Level	Course Outcome
	with a terminated with load resistance of 500 ohms		
4.	Design a high pass filter with a cut off frequency of 1 khz with a terminated impedance of 800 ohms	Evaluate	3
5.	Design a high pass filter having a cut-off frequency of 1 khz with a load of 600 ohms	Evaluate	3
	ASSIGNMENT-IV **UNIT-IV** **SHORT ANSWER QUESTIONS**		
1.	Why is open circuit characteristics called magnetic characteristic?	Analyze& Understand	4
2.	What do you mean by residual EMF in a generator?	Analyze	4
3.	State the function of commutator?	Analyze	4
4.	What is the purpose of brushes?	Analyze	4
5.	Why the brushes are made upon carbon?	Analyze	4
6.	Why is open circuit characteristics called magnetic characteristic?	Analyze	4
	DISCRIPTIVE ANSWER QUESTIONS		
1.	Draw the load characteristics of shunt, series and compound generators.	Creating &analyze	5
2.	Explain three point starter for D.C. Shunt motor.	Evaluate	5
3.	Explain in detail the constructional details of DC machine.	Evaluate	5
4.	Draw and explain the characteristics of DC Series generator	Analyse	5
5.	Explain construction of dc machine with neat diagram?	Evaluate	5
	ANALYTICAL ANSWER QUESTIONS		
1.	A 250 v shunt motor takes a total current of 20 amps the shunt field and armature resistances are 200 ohms and 0.3 ohms respectively determine 1)Value of back E.m.f 2) gross mechanical power in the armature.	Evaluate	4
2.	A 6 pole DC Long shunt generator having an armature ,series and shunt field resistances of 0.25 Ω ,0.5 and 100 Ω respectively delivers a load current of 35 Amps at a voltage of 200V .Take 2Volt as total brush drop. Calculate the induced EMF	Evaluate	4
3.	A 230 v motor has an armature circuit resistance of 0.6 ohms if the full load armature current is 30 amps, and no-load armature current is 4 amps, find change in bake mf from no-load to full load.	Evaluate	4
4.	A 4-pole motor is fed at 440 v and takes on armature current of 50 amps. The resistance of the armature circuit is 0..28 ohms the armature winding is wave connected with 888 conductors and useful flux per pole is 0.023 wb. Calculate the speed of the motor.	Evaluate	4
5.	Calculate the value of torque established by the armature of a 4pole motor having 774 conductors, two paths in parallel,24 mwb flux per pole , when the	Evaluate	4

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	total armature current is 50 amps.		
	ASSIGNMENT-V **UNIT-V** **SHORT ANSWER QUESTIONS**		
1	Draw the equivalent circuit diagram of transformer.	Evaluate	5
2	Explain the losses of transformer.	Evaluate	5
3	write short notes on oc and sc test	Evaluate	5
4	Draw the phasor diagram on no load of a transformer.	Analyze	5
5	Draw the phasor diagram on load of a transformer.	Remember	5
	DISCRIPTIVE ANSWER QUESTIONS		
1	Discuss about the constant losses in a transformer.	Understand	5
2	Explain the determination of deducing equivalent circuit parameters..	analyze	5
3	Derive the condition to have the maximum efficiency .	Creating &analyze	5
4	Explain the concept of regulation in detail, in the case of transformers.	Analyze	5
5	Discuss the types of transformers based on their application.	Apply	5
6	Explain the losses in a transformer and obtain the condition for maximum efficiency of a transformer	Evaluate	5
	ANALYTICAL ANSWER QUESTIONS		
1	A 40 kva transformer has iron losses 450 w and full load copper losses of 850 w if the power factor of the load is 0.8 lagging, calculate i) Full-load efficiency ii) the load at which maximum efficiency occurs iii) the maximum efficiency	Remember	5
2	In a 50 kva transformer the iron loss is 500 watts and full load copper loss is 800 watts find the efficiency at full load and half load at 0.8 pf lagging.	Apply	5
3	A 440/110 v transformer has a primary resistance of 0.03 ohms and secondary resistance of 0.02 ohms if iron losses at normal input is 150 watts determine the secondary current at which maximum efficiency will occur and the value of this maximum efficiency at a unity power factor load	Remember	5
4	The efficiency of a 400 kva ,single phase transformer is 98.77% when delivering full-load at 0.8 pf lagging and 99.13% at half load at unity power factor calculate i) iron losses and full load copper losses.	Creating &analyse	5
5	The emf per turn of a 1- φ, 2200/220 V, 50 Hz transformer is approximately 12V. Calculate i) The number of primary and secondary turns, and ii) The net cross-sectional area of core for a maximum flux density of 1.5 T.	Evaluate	5
6	a linear time invariant system is described by the following state model.obtain the canonical form of state model $\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix}=\begin{bmatrix}-1 & 0\\ 0 & -3\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}+\begin{bmatrix}1\\ 1\end{bmatrix}$u and y= $\begin{bmatrix}-1 & -2\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}$	Evaluate	5

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