



INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal, Hyderabad - 500 043

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ASSIGNMENT

Course code	:	A30204			
Course title	:	Electrical Circuits			
Course structure		Lectures	Tutorials	Practical	credits
		04	01		
Course Coordinator	:	Mr.T.Anil Kumar, ASSOCIATE PROFESSOR			

ASSIGNMENT I

UNIT 1

SHORT ANSWER QUESTIONS

Q NO.	QUESTION TO BE ANSWERED	BLOOM'S TAXANOMY	PO'S
1	Define the voltage, current ,power and energy.	REMEMBER	B,C
2	If three capacitors are in series with 10F, 12F and 5F ,calculate the equivalent capacitance	APPLY	A,B
3	If three inductors are in series with 100mH, 25mH and 35mH, calculate the equivalent inductance.	APPLY	A,B
4	Write the properties of inductor and capacitor.	UNDERSTAND	B,C

DISCRIPTIVE ANSWER QUESTIONS

1.	Derive the star –delta transformations.	UNDERSTAND	B,C
2.	Write short notes on source transformation	REMEMBER	B,C
3.	Classify the types of elements and explain in detail.	UNDERSTAND	B,C
4.	Explain the voltage-currents relations in RLC parameters.	UNDERSTAND	B,C

ANALYTICAL ANSWER QUESTIONS

1.	In an circuit brach AB = 20 ohms, BC = 20 OHMS, CD = 12 OHMS , BD = 7 ohms and DA = 6 OHMS and an source of 100V in series with 6 OHMS connected across A and C. use mesh analysis and find the currents in each element and voltage drop across 6 ohms.	APPLY	A,B
2.	In an network branch AD = 150V, AB = 10 OHMS, AC = 5 OHMS, BD = 4 OHMS , CD = 15 OHMS and BC = 8 OHMS, apply nodal analysis and find current through each element.	APPLY	A,B
3.	In an network branch AD = 150V, AB = 11 OHMS, AC = 8 OHMS, BD = 4 OHMS in series with 4A source, CD = 9 OHMS and BC = 12 OHMS, apply MESH analysis and find current through each element.	APPLY	A,B

4.	In an network consisting of AB terminals, firstly a branch across AB is defined as 100V in series with 25 ohms, second branch 7 ohms and third branch 50V in series with 15 ohms. Find the power consumed by 7 ohms.	APPLY	A,B
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ASSIGNMENT II

UNIT 2

SHORT ANSWER QUESTIONS

Q NO.	QUESTION TO BE ANSWERED	BLOOM'S TAXANOMY	PO'S
1.	Define peak, peak to peak, average, RMS and peak and form factor of sine wave.	REMEMBER	B,C
2.	Write the expressions of reactance offered by R,L,C.	REMEMBER	B,C
3.	Draw the impedance and power triangle and explain.	UNDERSTAND	B,C
4.	If frequency of supply is 100 rad/sec and is connected across 100 PF capacitor find reactance of capacitor.	APPLY	A,B

DISCRIPTIVE ANSWER QUESTIONS

1.	Steady state analysis of series RLC circuit.	EVALUATE	B,C
2.	Steady state analysis of series RL circuit.	EVALUATE	B,C
3.	Write short notes on concept of complex power.	EVALUATE	B,C
4.	Represent the reactance offered by RLC and explain in detail.	UNDERSTAND	B,C

ANALYTICAL ANSWER QUESTIONS

1	In an ac circuit two parallel impedances are in series with Z_1 across AB terminals , where AB terminals are fed by 200V 30 degrees. Calculate total impedance, admittance and current flowing through each element $Z_1 = (3+3j)$ ohms $Z_2 = (2 + 6j)$ ohms $Z_3 = (1 + 9j)$ ohms.	APPLY	A,B
2	In an ac circuit applied voltage is 100V 30 degrees total impedance of $(5 + 8j)$ ohms, calculate source current, power factor, complex power and circuit constants.	APPLY	A,B

ASSIGNMENT III**UNIT 3****SHORT ANSWER QUESTIONS**

Q NO.	QUESTION TO BE ANSWERED	BLOOM'S TAXANOMY	PO'S
1.	Define locus diagram.	REMEMBER	B,C
2.	Define resonance, series and parallel resonance.	REMEMBER	B,C
3.	Define flux density, field intensity, reluctance,permenance.	REMEMBER	B,C
4.	Define q-factor, cut off frequency and bandwidth.	REMEMBER	B,C

DISCRIPTIVE ANSWER QUESTIONS

1.	Explain the voltage wave forms of series RLC circuit with resonance phenomenon.	UNDERSTAND	B,C
2.	Draw the locus diagram of series RC with C variable.	UNDERSTAND	B,C
3.	Derive the expressions for cut off frequencies and bandwidth of series RLC circuit.	UNDERSTAND	B,C
4.	Explain the concept of composite circuit in detail.	UNDERSTAND	B,C

ANALYTICAL ANSWER QUESTIONS

1	An iron ring 10cm dia and 15cm ² in cross section is wound with 250 turns of wire for a flux density of 1.5 wb/cm ² and permeability 500. Find the exciting current the inductance and stored energy. Find corresponding quantities when there is a 2mm air gap.	APPLY	A,B
2	A constant voltage at a frequency of 1MHz is applied to an inductor in series with a variable capacitor when the capacitor is set to 500PF, the current has the max value while it is reduced to one half when capacitor is of 600PF. Find resistance, inductance and Q factor of inductor.	APPLY	A,B

ASSIGNMENT IV**UNIT 4****SHORT ANSWER QUESTIONS**

Q NO.	QUESTION TO BE ANSWERED	BLOOM'S TAXANOMY	PO'S
1.	Define graph,tree,co-tree,link and twig.	REMEMBER	B,C
2.	Write the rules to form incidence matrix.	UNDERSTAND	B,C
3.	Write the rules to form tie-set matrix.	UNDERSTAND	B,C
4.	Write the rules to form cut-set matrix.	UNDERSTAND	B,C

DISCRIPTIVE ANSWER QUESTIONS

1.	Explain the concept of dual and duality with an example.	UNDERSTAND	B,C
2.	Form the tie-set matrix for any network and form the mesh equations.	UNDERSTAND	B,C

3.	Form the cut-set matrix for any network and form the nodal equations.	UNDERSTAND	B,C
4.	Form the incidence matrix for any network and also explain the method to form the graph from incidence matrix	UNDERSTAND	B,C
ANALYTICAL ANSWER QUESTIONS			
1	In an network between AB 2 ohms, BC 2 H, CA 5F, AD 8F, BD 10 ohms and DC 5F form the dual network for the original one.	APPLY	A,B
2	In an circuit branch AB = 10 OHMS, BC = 20 OHMS, CD = 15 OHMS , BD = 8 ohms and DA = 5 OHMS and an source of 100V in series with 5 OHMS connected across A and C. form incidence matrix and write degree of each node.	APPLY	A,B

ASSIGNMENT V

UNIT 5

SHORT ANSWER QUESTIONS

Q NO.	QUESTION TO BE ANSWERED	BLOOM'S TAXANOMY	PO'S
1.	Is super-position theorem applicable for power measurement are not.	UNDERSTAND	B,C
2.	State tellegen's theorem.	REMEMBER	B,C
3.	Give the condition for maximum power transfer.	UNDESTAND	B,C
4.	Write the importance fo compensation theorem.	UNDERSTAND	B,C

DISCRIPTIVE ANSWER QUESTIONS

1	State and prove maximum power transfer theorem with AC excitation.	REMEMBER, UNDERSTAND	B,C
2	State and prove the tellegen's theorem	REMEMBER, UNDERSTAND	B,C
3	State and prove the super-position theorem	REMEMBER, UNDERSTAND	B,C
4	State and explain milliman's theorem with AC excitation.	REMEMBER, UNDERSTAND	B,C

ANALYTICAL ANSWER QUESTIONS

1	In an circuit brach AB = 10 OHMS, BC = 20 OHMS, CD = 15 OHMS , BD = 8 ohms and DA = 5 OHMS and an source of 100V in series with 5	APPLY	A,B
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	OHMS connected across A and C. verify the tellegen's theorem.		
2	In an series circuit $Z1 = (10 + 10j)$ ohms, $Z2 = (5 + 3j)$ ohms with 100V 45 degrees supply. Apply compensation theorem and find the response in $Z2$.	APPLY	A,B
3	In an network consisting of AB terminals , firstly a branch across AB is defined as 100V in series with $(3 + 4j)$ ohms , second branch 7 ohms and third branch 50V in series with $(2 + 3j)$ ohms. Apply thevenin's theorem to find current flowing through 7 ohms	APPLY	A,B