



INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal, Hyderabad - 500 043

MECHANICAL ENGINEERING

ASSIGNMENT

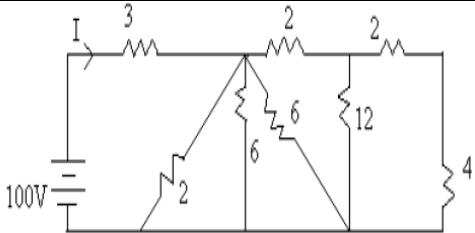
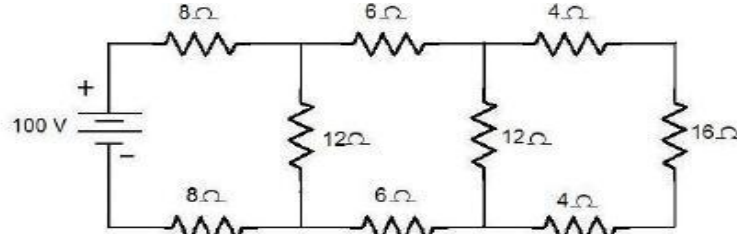
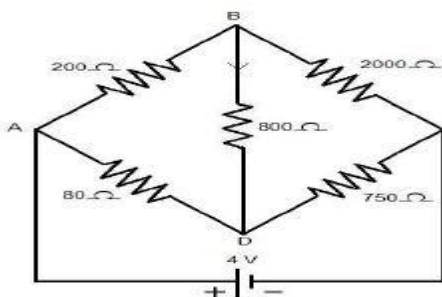
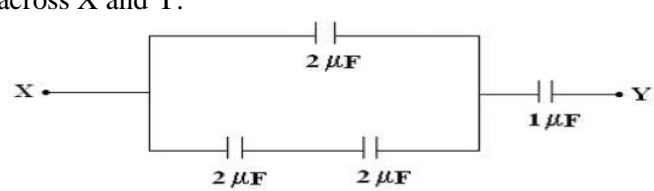
Course Name	:	Electrical and Electronics Engineering
Course Code	:	A40203
Class	:	II B. Tech I Semester
Branch	:	Mechanical Engineering
Year	:	2015 – 2016
Course Faculty	:	Mr. P.Mabu Hussain, Assistant Professor

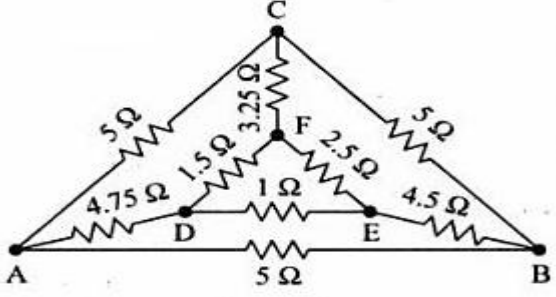
OBJECTIVES

Electrical And Electronics Engineering course is belongs to basic knowledge of high voltage and low voltage Circuits. This course introduces the basic concepts of circuit analysis which is the Foundation for all subjects of the Electrical Engineering discipline. The course deals with the basic analysis of single phase circuits, DC machines, AC machines and principles of indicating instruments. It emphasis basics of electronics, semiconductor devices and their characteristics and operational features.

S. No	Question	Blooms Taxonomy Level	Course Outcome
ASSIGNMENT-I (SHORT ANSWER TYPE QUESTIONS)			
1	Define Ohm's law	Understand	1
2	Mention the limitations of Ohm's Law	Analyze	1
3	Define Kirchhoff's voltage law and Kirchhoff's Current law. State Kirchhoff's Current law	Understand	3
4	Write short notes on resistor, capacitor, and inductor with relevant expression	Understand	3
5	Derive the star-delta conversion equations?	Evaluate	1
6	What is mean by instrument? Write Different types of instruments	Understand	1
7	Define a)Air friction damping b)Fluid friction damping c)Eddy current damping	Understand	3
8	Write Short notes on different types of torques	Evaluate	4
9	Define a) Voltage b) Current c) Power	Analyze	3
10	Give an Examples of Series and Parallel Resistor Networks	Analyze	3
11	What are the basic parts of a dc generator?	Understand	3
12	Discuss about back emf in DC motor?	Analyze	3
13	Describe the different types of Generators.	Understand	3
14	Discuss about any two types of DC generators	Remember	3
15	What are the applications of DC motors?	Analyze	5
16	Describe about Commutator principle of operation.	Understand	3

S. No	Question	Blooms Taxonomy Level	Course Outcome
17	Differentiate between self-excited and separately excited DC machines.	Understand	5
18	Calculate the e.m.f by 4 pole wave wound generator having 65 slots with 12 conductors per slot when driven at 1200 rpm the flux per pole is 0.02 wb.	Evaluate	2
19	A dynamo has a rated armature current at 250 amps what is the current per path of the armature if the armature winding is lap or wave wound? The machine has 12 poles.	Evaluate	4
20	Draw the characteristics for DC shunt generator.	Analyze	3
21	What are the basic parts of a dc generator?		
22	Discuss about back emf in DC motor?		
23	Describe the different types of Generators		
24	Discuss about any two types of DC generators		
25	What are the applications of DC motors?		
26	Describe about Commutator principle of operation.		
27	Differentiate between self-excited and separately excited DC machines.		
28	Calculate the e.m.f by 4 pole wave wound generator having 65 slots with 12 conductors per slot when driven at 1200 rpm the flux per pole is 0.02 wb.		
29	A dynamo has a rated armature current at 250 amps what is the current per path of the armature if the armature winding is lap or wave wound? The machine has 12 poles.		
30	Draw the characteristics for DC shunt generator.		
31	Mention the difference between core and shell type transformers.		
32	Does transformer draw any current when secondary is open? Why?		
33	Define voltage regulation of a transformer		
34	Derive the EMF equation of a transformer..		
35	Obtain the condition for maximum efficiency of a transformer		
36	Describe the construction of a core type transformer.		
37	Discuss about the torque slip characteristics of an Induction motor		
38	Differentiate between squirrel cage induction motors and slip ring induction motors.		
39	Describe the principle of alternator		
40	Why does the rotor in an induction motor rotate?		
LONG ANSWER QUESTIONS)			
1	A voltage of 200 V is applied to a tapped resistor of 500Ω. Find the resistance between the tapping points connected to a load, needing 0.1A at 25 V. Also calculate the Total power consumed		
2	If 3 capacitors of values 2mF, 4mF, 5mF are connected in parallel. Calculate the effective capacitance		
3	Determine the current I in the circuit shown in figure. All resistances are in ohms.		

S. No	Question	Blooms Taxonomy Level	Course Outcome
			
4	<p>Calculate a) the equivalent resistances across the terminals of the supply, b) total current supplied by the source and c) power delivered to 16 ohm resistor in the circuit shown in the figure shown below.</p> 		
5	<p>Determine the current through 800 ohm resistor in the network shown in figure</p> 		
6	<p>Find the equivalent capacitance of the combination shown figure below across X and Y.</p> 		
7	Describe the working principle of permanent magnet moving coil instrument		
8	Describe the working principle of moving iron attraction type instrument		
9	Discuss about series and parallel networks of resistor, inductor and capacitor.		
10	Find the resistance between the A and B by using star delta		

S. No	Question	Blooms Taxonomy Level	Course Outcome
	 <p>conversion</p>		
12	Describe the principle of operation of DC generator.		
13	Derive the equation for induced EMF of a DC machine		
14	Give the classification of DC generator and explain		
15	Derive the torque equation of DC motor		
16	Explain construction of dc machine with neat diagram?		
17	<p>A 6 pole lap wound dc generator has 600 conductors on its armature flux per pole is 0.02 wb. Calculate</p> <p>i) The speed at which the generator must be run to generate 300v.</p> <p>ii) What would be the speed if the generated were wave wound?</p>		
18	An 8-pole, lap wound armature rotated at 350 rpm is required to generate 260v. The use full flux per pole is 0.05 wb if the armature has 120 slots, calculate the number of conductors per slot.		
19	A 440v Dc shunt generator has $R_a=0.25$ ohms and $R_{sh}= 220$ ohms while delivering a load current of 50 amps, it has a terminal voltage of 440v determine the generated e.m.f and power developed?		
20	A Dc series generator has armature resistance of 0.5 ohms and series field resistance of 0.03 ohms it drives a load of 50 amps. if it has 6 turns/coil and total 540 coils on the armature and is driven at 1500 rpm calculate the terminal voltage at the load. Assume 4-poles, lap type winding, flux pole as 2 mwb and total brush drop as 2V.		
21	Explain three point starter for D.C. Shunt motor.		
22	Describe the construction and operation of single phase transformer.		
23	Describe the method to perform OC and SC test on a transformer		
24	A transformer supplied a load of 32A at 415V. If the primary voltage is 3320V, find the following: (a) Secondary volt ampere (b) Primary current(c) Primary volt ampere. Neglect losses and magnetizing current		
25	<p>A transformer with 40 turns on the high voltage winding is used to step down the voltage from 240V to 120V. Find the number of turns in the low voltage winding. Open circuit and short circuit tests on a 5 KVA, 220/400V, 50 Hz, single phase transformer gave the following results:</p> <p>OC Test: 220V, 2A, 100W (lv side)</p> <p>SC Test: 40V, 11.4A, 200W (hv side)</p>		

S. No	Question	Blooms Taxonomy Level	Course Outcome
	Obtain the equivalent circuit		
26	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.		
27	Describe the working principle and construction of a 3 phase induction motor		
28	A 6-pole, 50Hz squirrel cage induction motor runs on load at a shaft speed of 970 rpm. Calculate i) Percentage slip ii) The frequency of the induced current in the rotor.		
29	The emf in the stator of an 8 pole induction motor has a frequency of 50 Hz and that in the rotor is 1.5Hz. At what speed the motor is running and what is the slip?		
30	Discuss about synchronous impedance method to find regulation of an alternator		
31	Describe the principle and construction of salient pole and non salient pole alternator		
ASSIGNMENT-II			
(SHORT ANSWER TYPE QUESTIONS)			
1	Explain avalanche breakdown?		
2	Differentiate intrinsic and extrinsic semiconductors?		
3	Sketch the Energy bands in n-type and p-type semiconductor		
4	Define static and dynamic resistance?		
5	Discuss importance of Active region?		
6	Express importance of Cut in voltage?		
7	Design a circuit for transistor as a switch?		
8	Define saturation region?		
9	Derive relationship among α , β ?		
10	Explain majority and minority carriers in a semiconductor?		
11	Name two applications of a Crystal diode		
12	Explain the function of deflection plates?		
13	Explain is the purpose of accelerating anode?		
14	Explain the function of vertical plates in CRT?		
15	Explain the function of horizontal plates?		
16	Discuss the use of Fluorescence?		
17	Explain the Principle of dual beam oscilloscope?		
18	Explain the principle of sampling oscilloscope?		
19	Mention the two modes of operation in dual trace oscilloscope		
20	List the Disadvantages of storage cathode ray tube?		
21	Define Electric Field?		
(LONG ANSWER QUESTIONS)			

S. No	Question	Blooms Taxonomy Level	Course Outcome
1	Explain the theory of PN junction in semiconductors and explain how it acts as diode?		
2	Explain different biasing conditions of the PN junction crystal diode		
3	Discuss V-I characteristics of a silicon PN junction crystal diode and Analyze the significance of the knee voltage?		
4	Analyze the effect of temperature on the volt – ampere characteristics of a diode.		
5	Zenar diode works in reverse biased condition. How the Zener diode and its breakdown mechanism work as regulator?		
6	Describe the Diode current equation.		
7	What is the importance of a filter in voltage rectification process		
8	Define rectifier? Describe all parameters for Half wave rectifier?		
9	Describe all parameters for Centre tapped full wave rectifier?		
10	Define rectifier? Describe all parameters for bridge rectifier?		
11	Discuss the difference between Half waves; centre tapped full wave and bridge rectifiers.		
12	Explain the operation of SCR and its V_I characteristics?		
13	Explain the term α and β current gains and their relationship for N-P-N transistor?		
14	Explain the operation of NPN and PNP transistor?		
15	Illustrate with a diagram, how the BJT transistor acts as an amplifier?		
16	Give the construction of a Cathode Ray tube using electrostatic focusing and deflection systems and describe the functions of various constituents.		
17	Give the construction of a Cathode Ray tube using magnetic focusing and deflection systems and describe the functions of various constituents.		
18	Write the principle of CRT? Explain the different types of CROs?		
19	Explain the Block diagram of CRO with neat sketch?		
20	Discuss critically functional block diagram of CRT?		
21	Explain the applications of CRO?		
22	Explain the electron gun construction and working?		
23	How the magnetic deflection system works in CRT?		
24	Explain the Electrostatic deflection system in CRT?		
25	Differentiate Electrostatic and magnetic deflection systems?		
26	Describe the voltage, current and frequency measurements using CROs.		

Prepared by: Mr. D.kumar, Assistant Professor

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