



INSTITUTE OF AERONAUTICAL ENGINEERING (AUTONOMOUS) Dundigal, Hyderabad -500 043

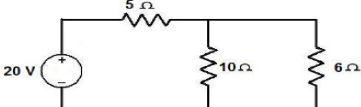
INFORMATION TECHNOLOGY ASSIGNMENT

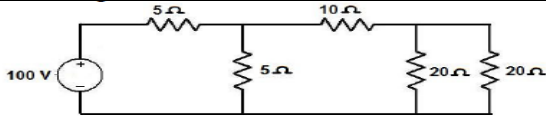
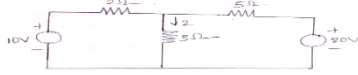
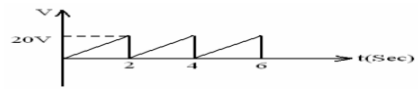
Course Name	:	BASIC ELECTRICAL ENGINEERING
Course Code	:	A30202
Class	:	II B. Tech I Semester
Branch	:	Information Technology
Year	:	2015 – 2016
Course Faculty	:	Ms. S Swathi, Assistant Professor

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 Aeronautical Engineering, 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.

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT -1			
INTRODUCTION TO ELECTRICAL ENGINEERING AND NETWORK ANALYSIS			
1	Explain two capacitors are connected in series then $C_{eq} = C1C2/C1+C2$?	Evaluate	1
2	Explain derivation of star-delta conversion equations?	Evaluate	2
3	Explain about series and parallel networks of inductor?	Understand	1
4	Explain superposition theorem?	Remember	3
5	Explain derivation the condition for maximum power transfer theorem?	Evaluate	3
6	Find the power consumed by each resistor? 	Apply	1
7	Find the current in each resistor?	Apply	3

S. No	Question	Blooms Taxonomy Level	Course Outcome
			
8	Calculate how to combine four 100 ohm resistors to obtain an equivalent resistance of a. 25 ohm, b. 60 ohm, c. 40 ohms?	Apply	2
9	Calculate the current 'I' shown in figure using super position theorem? 	Apply	2
10	If 3 capacitors of values 2mF, 4mF, 5mF are connected in parallel. Calculate the effective capacitance?	Apply	2
UNIT –II ALTERNATING QUANTITIES			
1	Illustrate following terms: i) Impedance ii) admittance iii) susceptance iv) conductance v) Power factor ?	Remember	7
2	Write about series RL circuit?	Understand	7
3	Write about series RC circuit?	Understand	7
4	Explain behavior of RLC Series circuit?	Understand	7
5	Explain i) rectangular form ii) polar form?	Understand	7
6	Determine the average and effective values of saw-tooth waveform as shown in below figure 	Apply	7
7	Two impedances $Z_1 = 20 + j10$ and $Z_2 = 10 - j30$ are connected in parallel and this combination is connected in series with $Z_3 = 30 + jx$. Find the value of 'x' which will produce resonance?	Apply	7
8	Convert from rectangular to polar $z = 30 + j60$?	Apply	7
9	Convert from rectangular to polar $z = 45 + j50$?	Apply	7
10	A circuit consists of a resistance of 15ohm, a capacitance of 200 micro Farad and inductor of 0.05H all in series. If supply of 230V, 50Hz is applied to the ends of circuit. Calculate i) Current in the coil ii) Potential difference across each element?	Apply	7
UNIT –III TRANSFORMERS			
1	Explain the construction details of transformer?	Understand	5

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2	Explain the principle of operation of transformer?	Understand	5
3	Explain the ON load condition of a transformer?	Understand	5
4	Explain the condition for maximum efficiency of a transformer?	Evaluate	5
5	Explain the equivalent circuit of a single phase transformer?	Evaluate	5
6	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?	Apply	5
7	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?	Apply	5
8	A 125 KVA transformer having primary voltage of 2000V at 50 Hz has 182 primary and 40 secondary turns. Neglecting losses, calculate : i) The full load primary and secondary currents. ii) The no-load secondary induced emf. iii) Maximum flux in the core?	Apply	5
9	Open Circuit and short circuit tests on a single phase transformer gave the following results. V ₀ =200V, I ₀ =0.7A, W ₀ =20W ----- test from primary side V _S =10V, I _S =10A, W _S =40W ----- test from primary side. Determine the equivalent circuit referred to primary side?	Apply	5
10	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	Apply	5
UNIT –IV DC AND AC MACHINES			
1	Classify of DC generator and explain?	Understand	5
2	Derive the equation for induced EMF of a DC generator?	Evaluate	5
3	Derive the torque equation of DC motor?	Evaluate	5
4	Explain the principle and construction of a 3 phase induction motor?	Understand	6
5	Sketch the load characteristics of shunt, series and compound generators?	Understand	6
6	A 6 pole lap wound dc generator has 600 conductors on its armature flux per pole is 0.02 wb. Calculate i) The speed at which the generator must be run to generate 300v. ii) What would be the speed if the generated were wave wound?	Apply	5
7	A 230 volts dc shunt motor takes 51 A at full load. Resistances of armature and field windings are 0.1ohm and 230 ohms respectively. Determine i.	Apply	5

S. No	Question	Blooms Taxonomy Level	Course Outcome
	armature current ii. Field current iii. Back emf developed at full load?		
8	In case of an 8-pole induction motor the supply frequency was 50 Hz and the shaft speed was 735 rpm. Calculate i) Synchronous speed ii) Slip speed per unit slip iii) Percentage slip?	Apply	6
9	Calculate the value of torque established by the armature of a 4pole motor having 774 conductors, two paths in parallel, 24 m wb flux per pole, when the total armature current is 50 amps.	Apply	5
10	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 2V as total brush drop. Calculate the induced EMF?	Apply	5
UNIT –V BASIC INSTRUMENTS			
1	Explain working principle of permanent magnet moving coil instrument?	Understand	4
2	Explain working principle of moving iron repulsion type instrument?	Understand	4
3	Explain working principle of moving iron attraction type instrument?	Understand	4
4	Explain working of different types of torques produced in indicating instruments?	Understand	4
5	Explain i) Deflecting torque ii) Controlling torque iii) Damping torque?	Understand	4
6	A PMMC instrument has a coil dimensions 15mm*12mm. the flux density in the air gap is 1.8 mWb/m*m and the spring constant 0.14micro N-m/rad. Determine the number of turns required to produce an angular deflection of 90degrees when a current of 5mA is flowing through the coil?	Apply	4
7	A PMMC instrument has a coil dimensions 18mm*16mm. the flux density in the air gap is 1.5 mWb/m*m and the spring constant 0.18micro N-m/rad. Determine the number of turns required to produce an angular deflection of 90degrees when a current of 7mA is flowing through the coil?	Apply	4
8	A moving-coil instrument gives a full scale deflection. When the current is 40 mA and its resistance is 25. Calculate the value of the shunt to be connected in parallel with the meter to enable it to be used as an ammeter for measuring currents up to 50 A?	Apply	4
9	A moving-coil instrument having a resistance of 10 ohms, gives a full scale deflection. When the current is 8 mA. Calculate the value of the multiplier to be connected in series with the instrument so that it can be used as a voltmeter for measuring full scale deflection up to 100 V?	Apply	4
10	A moving-coil instrument having a resistance of 20, gives a f.s.d. When the current is 5 mA. Calculate the value of the multiplier to be connected in series with the instrument so that it can be used as a voltmeter for measuring full. Scale. Deflection up to 200 V?	Apply	4

Prepared by: Ms. S Swathi Assistant Professor

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