

QP Code

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 Register Number

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VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution, Affiliated to Anna University, Chennai)

Semester Examinations – April / May 2017 Regulations-2016

Programme: B.E. Semester: 2 Max. Marks: 100 Duration 3 Hrs
Course Code & Title: 16EET23 ELECTRIC CIRCUITS AND MACHINES

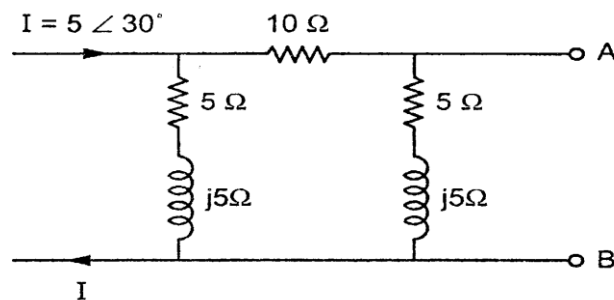
Knowledge	K1 - Remembering	K3 - Applying	K5 – Evaluating
Levels (KL)	K2 - Understanding	K4 – Analysing	K6 – Creating

Part A - Answer ALL Questions. 10 x 2 = 20 Marks

No.	Question	KL
1.	A star connected resistive network consists of 2Ω in each arm. Draw the equivalent delta-connected network.	K3
2.	State Millman's theorem.	K1
3.	Two inductively coupled coils have self inductance $L_1 = 50$ mH and $L_2=200$ mH. If the coefficient of coupling is 0.5, compute the value of mutual inductance between the coils.	K5
4.	What are tuned circuits?	K1
5.	Specify the reason for transformer rating in kVA and not in kW.	K2
6.	Enumerate the advantages of an auto transformer.	K1
7.	Cite the means to reverse the direction of rotation of a 3-phase induction motor.	K2
8.	Define voltage regulation of a synchronous generator.	K1
9.	The single phase induction motor is not self starting – Justify.	K2
10.	Depict the torque- speed characteristics of single phase induction motor.	K2

Part B - Answer ALL Questions. 5 x 16 = 80 Marks

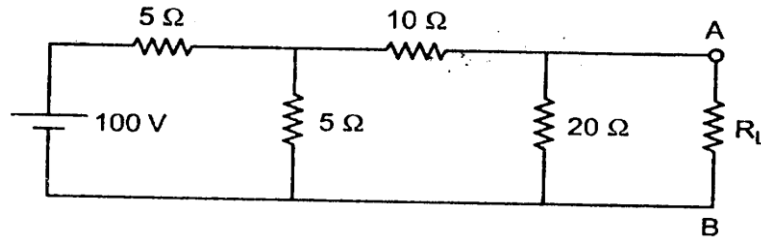
No	Question	Marks	KL
11.	a i. Find the Thevenins equivalent circuit for the network shown at the terminals AB.	12	K5



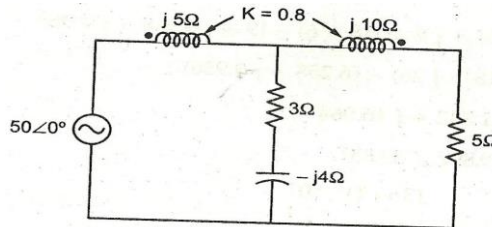
ii.	Write the steps to solve the super position theorem.	4	K1
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OR

- b i. Derive the condition for maximum power transfer in a DC circuit with pure resistive load. 8 K2
- ii. Find the value of R_L so that maximum power is delivered to it. 8 K5



12. a i. In the coupled circuit shown in the fig, find the voltage across the 5Ω resistor. 8 K3



- ii. Derive the equivalent inductance of two coils connected in series aiding and opposing connection. 8 K2

OR

- b i. Obtain the expression for coefficient of coupling for single tuned circuits. 12 K2
- ii. State and explain the dot convention of coupled circuits. 4 K2
13. a i. Obtain the equivalent circuit of a transformer referred to primary. 12 K2
- ii. Classify the types of transformers. 4 K1

OR

- b i. Explain the 1Φ transformer considering resistance and reactance on load condition and draw the necessary phasor diagrams under unity, lagging and leading power factors. 12 K2
- ii. Explain the losses present in a transformer. 4 K1
14. a i. Explain the construction of a three phase induction motor. 8 K1
- ii. Develop an equivalent circuit for three phase induction motor. 8 K2

OR

	b	i.	With a neat sketch, describe the principle of operation of a three phase alternator.	8	K2
		ii.	Derive EMF equation of an alternator.	8	K2
15.	a	i.	With relevant sketches, explain the double field revolving theory of single phase induction motor.	8	K2
		ii.	Illustrate the working principle of split phase capacitor start induction motor.	8	K1
OR					
	b	i.	Discuss the principle of operation of a stepper motor.	12	K2
		ii.	Summarize the applications of stepper motors.	4	K1
