Printed Pages: 02   **Sub Code:KEE201**

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B TECH
(SEM II) THEORY EXAMINATION 2018-19
ELECTRICAL ENGINEERING

Time: 3 Hours   *Total Marks: 100*

Note: **1.** Attempt all Sections. If you require any missing data, choose suitably.

SECTION A

|			CO
1.	**Attempt all questions in brief.**	**2 x 10 = 20**	
a.	Define the purpose of Earthing the electrical appliances		5
b.	What are the various three phase transformer connections? Name them.		3
c.	Explain why transformer cannot be operated on DC.		3
d.	What is difference between primary and secondary batteries?		5
e.	Define active and passive elements.		1
f.	Three resistances each of 20Ω, 30Ω & 50Ω are connected in delta. Calculate corresponding resistances in equivalent star connection.		1
g.	What is phase angle difference between the voltage and current phasors in purely capacitive circuits?		2
h.	A 3-phase, 440V, induction motor is wound for 4 poles and is supplied from 50Hz supply system. Calculate the speed of the motor when slip is 5%.		4
i.	Write condition for series resonance.		2
j.	Write applications of synchronous motor.		4

SECTION B

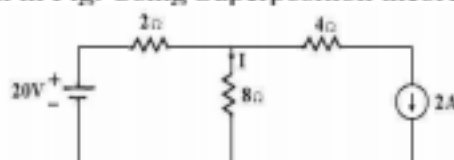|		Marks	CO
2.	**Attempt any three of the following:**		
a.	Derive the relationship in delta and star connected systems?	10	1
b.	Derive the expression for the average power in a single phase purely Resistive circuit. Also draw the phasor diagram and waveform diagram for this circuit.	10	2
c.	An 1100/110V, 22KVA, 1ϕ transformer has primary resistance and reactance 4Ω and 6Ω respectively. The secondary resistance and reactance are 0.04Ω and 0.065Ω respectively. Calculate (i) Equivalent resistance and reactance of secondary referred to primary. (ii) Total resistance & reactance referred to primary. (iii) Equivalent resistance and reactance of primary referred to secondary. (iv) Total copper loss	10	3
d.	Derive and explain torque-slip Characteristics of 3-phase Induction motor.	10	4
e.	Explain (i) MCB (ii) ELCB (iii) MCCB	10	5

SECTION C

3. **Attempt any *one* part of the following:**   Marks   CO

a.   Determine current through $2\,\Omega$ resistor using Thevenin theorem.   10   1
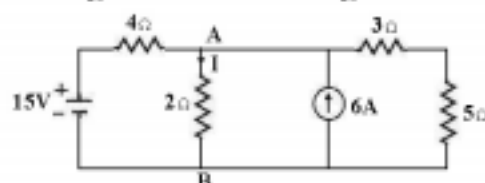
b.   Determine current through $8\,\Omega$ resistor and power in the $4\,\Omega$ resistor in   10   1
the Network shown in Fig. Using Superposition theorem.

4. **Attempt any *one* part of the following:**   Marks   CO

a.   Why is a single phase induction motor is not self starting. Also explain   10   4
the various starting methods.

b.   A 250V dc shunt motor takes 41A at full load. Resistances of motor   10   4
armature and shunt field winding are $0.1\,\Omega$ and $250\,\Omega$ respectively.
Find the back emf on full load. What will be generated emf, if working
as generator and supplying 41A to a load at terminal voltage of 250V?

5. **Attempt any *one* part of the following:**   Marks   CO

a.   Derive half power frequencies, bandwidth and quality factor for series   10   2
resonance occurring in a series R-L-C circuit.

b.   A balanced delta connected load of 12+j9 ohm is connected to 3 phase   10   2
400 V supply. Find (i) Line current (ii) power factor (iii) power drawn
(iv) reactive volt amp (v) total volt amp

6. **Attempt any *one* part of the following:**   Marks   CO

a.   What is an Auto Transformer? What are the advantages and   10   3
disadvantages of using an Auto Transformer? Explain (without
derivation) how the efficiency varies when a normal two winding
transformer is converted into an Auto Transformer.

b.   A transformer is rated at 100kVA. At full load its copper loss is   10   3
1200Watts and iron losses are 960W. Calculate: (i) Efficiency at full
load, unity pf   (ii) Efficiency at half load, 0.8 pf lagging. (iii)
Efficiency at 75% full load, 0.7 pf lagging (iv) The load KVA at
which maximum efficiency occurs (v) The maximum efficiency at
0.85 pf lagging

7. **Attempt any *one* part of the following:**   Marks   CO

a.   Describe electrical characteristics of lead acid battery.   10   5
b.   Explain the construction, rating and specific applications of at least two   10   5
types of Wires and Cables used in electrical engineering.