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

Paper Id: 120262 **Roll No.**

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

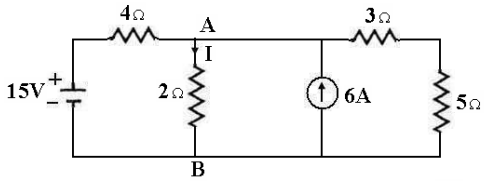
1.	**Attempt *all* questions in brief. 2 x 10 = 20**	CO
a.	Define the purpose of Earthing the electrical appliances	5
b.	What are the various three phase transformer connections? Name them.	3
c.	Explain why transformer cannot be operated on DC.	3
d.	What is difference between primary and secondary batteries?	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

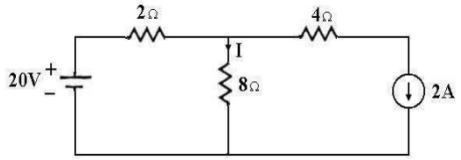
2.	**Attempt any *three* of the following:**	Marks	CO
a.	Derive the relationship in delta and star connected systems?	10	1
b.	Derive the expression for the average power in a single phase purely Resistive circuit. Also draw the phasor diagram and waveform diagram for this circuit.	10	2
c.	An 1100/110V, 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

		Marks	CO
3.	**Attempt any *one* part of the following:**		
a.	Determine current through 2 Ω resistor using Thevenin theorem.	10	1



b.	Determine current through 8 Ω resistor and power in the 4 Ω resistor in the Network shown in Fig. Using Superposition theorem.	10	1



		Marks	CO
4.	**Attempt any *one* part of the following:**		
a.	Why is a single phase induction motor is not self starting. Also explain the various starting methods.	10	4
b.	A 250V dc shunt motor takes 41A at full load. Resistances of motor armature and shunt field winding are 0.1 Ω and 250 Ω 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?	10	4
5.	**Attempt any *one* part of the following:**	Marks	CO
a.	Derive half power frequencies, bandwidth and quality factor for series resonance occurring in a series R-L-C circuit.	10	2
b.	A balanced delta connected load of 12+j9 ohm is connected to 3 phase 400 V supply. Find (i) Line current (ii) power factor (iii) power drawn (iv) reactive volt amp (v) total volt amp	10	2
6.	**Attempt any *one* part of the following:**	Marks	CO
a.	What is an Auto Transformer? What are the advantages and 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.	10	3
b.	A transformer is rated at 100kVA. At full load its copper loss is 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	10	3
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 types of Wires and Cables used in electrical engineering.	10	5