

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**

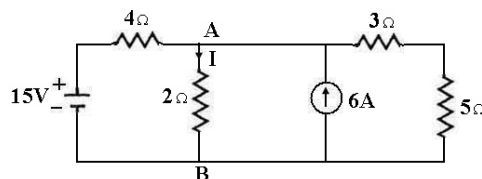
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|-----------|---|--------------------|-----------|
| <b>1.</b> | <b>Attempt all questions in brief.</b>  | <b>2 x 10 = 20</b> | <b>CO</b> |
| a.        | Define the purpose of Earthing the electrical appliances  |                    | 5         |
| 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 $20\Omega$ , $30\Omega$ & $50\Omega$ 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**

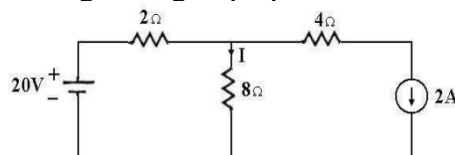
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|-----------|---|--------------|-----------|
| <b>2.</b> | <b>Attempt any three of the following:</b>  | <b>Marks</b> | <b>CO</b> |
| a.        | Derive the relationship in delta and star connected systems?  | 10           | 1         |
| b.        | 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, $1\phi$ transformer has primary resistance and reactance $4\Omega$ and $6\Omega$ respectively. The secondary resistance and reactance are $0.04\Omega$ and $0.065\Omega$ respectively. Calculate<br>(i) Equivalent resistance and reactance of secondary referred to primary.<br>(ii) Total resistance & reactance referred to primary.<br>(iii) Equivalent resistance and reactance of primary referred to secondary.<br>(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 the Network shown in Fig. Using Superposition theorem. 10 1



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

- 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  $0.1\ \Omega$  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? 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