14/1/19
9.30-12.30

ROLLNO: PAPER CODE: TEE-201

END SEMESTER Back EXAMINATION, 2019
B.Tech - I Semester
Paper name: Basic Electrical Engg

TIME: THREE HOURS **MM: 100**

NOTE:

- This question paper contains five questions with alternative choices.
- All questions are compulsory.
- Each question carries three parts a, b or c. Attempt either parts a and b or
- Each part carries **ten** marks. Total marks assigned to each question are **twenty.**

Q1. **a**. Draw and explain the Speed torque characteristics of series and shunt dc motor.

b. Derive the relation for Bandwidth in series RLC ac circuit.

c. Explain the following with suitable examples and/or circuit diagram(s):

(i) Power factor (ii) Dependent and Independent Sources (iii) Bilateral and Nonlinear elements, (iv) Active and Unilateral elements

Q2. **a**. Explain the principle of single phase transformer and draw different equivalent circuit with referred to primary and secondary side.

b. A 250 V source whose frequency is variable, is impressed across a series RLC circuit with R = 100 ohm, L = 1 H and C = 650 μF. Determine: the following, resonant frequency of the circuit, current at resonance, voltage developed across L and C at resonance, Q factor, bandwidth, and new value of inductance required to change the resonance frequency to 350 rad/sec.

c. Derive relationship between phase current and line current in Delta connection with Phasor Diagram. Determine power relation in three phase ac circuit.

Q3. a. State and prove maximum power transfer theorem for dc circuit and prove that efficiency of circuit would be 50%.

b. Rotor of a 6 pole 3-phase induction motor operates from a supply whose frequency is 50Hz. Calculate (i) Speed at which magnetic field is rotating w.r.t. stator, (ii) Speed of rotor when the slip is 0.06, (iii) Frequency of rotor currents at stand still.

c. State and Explain Superposition Theorem with an example

Q 4 a. Derive relation for star to delta conversion having all resistance equal in the circuit.

b. Explain Eddy current and Hysteresis loss in magnetic circuits.

c. State and explain Norton's Theorem with an example.

Q5. a. Explain Open Circuit test and Short circuit test with calculation of no load and full load parameter in single phase transformer.

b. The efficiency of a 20KVA, 2500/250V, single phase transformer of 0.9 power factor is 97.8% at rated load and 95% with 0.8 power factor also at rated load. Determine

(i) Transformer core loss (ii) Full load copper loss.

c. Explain KCl and KVL and ohm's law with complete justification.