

Date - 20/9/18 1:30-3:00

ROLLNO:

PAPER CODE: TEE-101/201

End SEMESTER Back EXAMINATION, 2018

B.Tech - I/II Semester

Basic Electrical Engineering

TIME: THREE HOUR

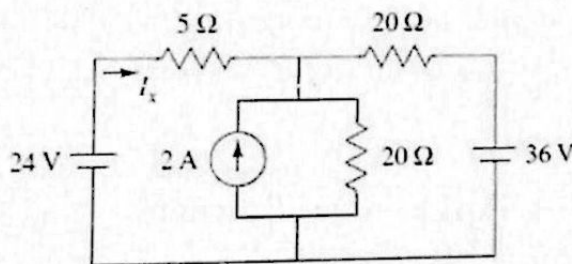
MM: 100

NOTE:

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

Q1. a. Explain Superposition theorem with a suitable example.

b. Using any analysis, determine the current voltage across 20 Ohm resistance



(10x2 = 20 Marks)

c. Explain the following with suitable examples and/or circuit diagram(s):
Peak Factor, (ii) Average Value, (iii) Bandwidth, (iv) RMS Value

Q2. a. Explain the following with suitable examples and/or circuit diagram(s)

(i) KVL law, (ii) node and mesh, (iii) Linear and Nonlinear elements, (iv) Unilateral and Bilateral Elements

b.

A 70 ohm resistor, a 5 mH coil and a 15 pF capacitor are in series across a 110 volt supply. Determine the resonant frequency the Q of the circuit at this frequency, the voltage across the capacitor at resonance.

c. Derive relationship between phase voltage and line voltage in Star connection and line current and phase current in Star connection.

Q3. a. Derive the maximum efficiency condition for single phase transformer.

b. Rotor of a 4 pole 3-phase induction motor operates from a supply whose frequency is 60Hz. Calculate (i) Speed at which magnetic field is rotating w.r.t. stator, (ii) Speed of rotor when the slip is 0.05, (iii) Frequency of rotor currents at stand still.

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

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

b. A 150 kVA single phase transformer has iron losses of 900w and copper loss of 1000 watt when supplying its full load at unity p.f. Calculate the efficiency of the transformer at unity power factor at full load and half load.

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

Q5. a. Explain the testing of single phase transformer with its equivalent circuit.

b. The efficiency of a 20KVA, 2500/250V, single phase transformer of unity power factor is 90% at rated load and also at half rated load. Determine

(i) Transformer core loss (ii) 85% of full load copper loss.

c. Prove that bandwidth in series RLC ac circuit is inversely proportional to Quality factor of the circuit.