16/05/19 (m) EL-May-19   *Duplicate*

May 2019
B.Tech. 1/2 SEMESTER
Electrical Technology (E-105)

Time 3 Hours

Max. Marks:60

Instructions:
1. It is compulsory to answer all the questions (2 marks each) of Part -A in short.
2. Answer any four questions from Part -B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

PART –A

Q1 (a) State limitations of ohm's law? (2)

(b) Define quality factor of a coil? (2)

(c) What are 1. Form factor 2. Peak factor (2)

(d) Explain reciprocity theorem? (2)

(e) Why double earthing is required for earthing of power equipment? (2)

(f) What is power factor? Discuss the practical importance of power factor? (2)

(g) What are the features of resonance in parallel circuits? (2)

(h) What are the advantages of three – phase system over single-phase system? (2)

(i) What is the function of commutator in DC machines? (2)

(j) Give three industrial uses of 3-phase induction motor? (2)

PART –B

Q2 (a) State and explain superposition theorem with its limitations? (10)

(b) Explain the difference between Nodal analysis and mesh analysis to solve a given network? (5)

Q3 (a) Differentiate between statically induced emf, and dynamically induced emf? (5)

(b) Determine rms value, average value, form factor and peak factor for full wave rectified sinusoidal voltage. (10)

4 (a) State and explain Millimens theorem using suitable example? (10)

(b) Deduce analogy between magnetic circuit and electric circuit. What are the major points of difference between them? (5)

Q5 (a) A coil of P.F. 0.8 is in series with a 100 microfarad capacitor. When connected to a 50 Hz supply the voltage across the capacitor is equal to the voltage across the coil. Find the resistance and inductance of the coil? (5)

(b) A parallel circuit consists of a coil having 15 ohm resistance and 300 mH inductance in parallel with a capacitor of capacitance 4 microfarad. Determine (1) the resonant frequency (2) Dynamic impedance of the circuit (3) Q-factor of the circuit at resonance. (10)

Q6 (a) Write down the relationship between line voltage and line current with phase (5) voltage and phase current in star- connected circuits?

(b) Three similar coils each having a resistance of 15 ohm and an inductance of 0.04 H (10) are connected in star to a 3-phase 50HZ supply, 200 volts between the lines. Calculate the line current. If they are now connected in delta, calculate the phase current, line current and the total power absorbed in each phase.

Q7 (a) Explain the construction, and working principle of single –phase transformer? (10)

(b) Explain why a synchronous motor is not self- starting and give one method of (5) starting the synchronous motor?

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