## **FACULTY OF ENGINEERING**

## B. E. II – Semester (CE/EE/Inst./ECE/CSE/CME) (AICTE) (Main & Backlog) Examination, December 2020

**Subject: Basic Electrical Engineering** 

Time: 2 hours Max. Marks: 70

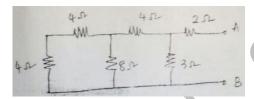
Note: (Missing data if, any can be assumed suitable)

PART - A

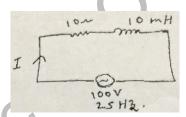
Answer any five questions.

 $(5 \times 2 = 10 \text{ Marks})$ 

- 1. State and explain Kirchhoff's current law.
- 2. Calculate the equivalent resistance between terminals A and B in the circuit.



- 3. Define RMS value and peak value of alternating quantity.
- 4. For the circuit shown calculate current I.



- 5. Draw no load phasor diagram of single phase transformer.
- 6. What is statically induced EMF.
- 7. Classify dc generators based on excitation.
- 8. List out the essential parts of DC machine.
- 9. What is Miniature Circuit Breaker (MBC)?
- 10. What is the importance of power factor?

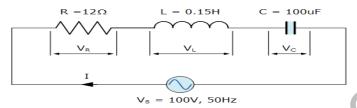
PART - B

Answer any four questions.

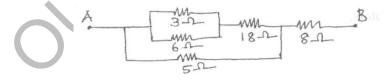
 $(4 \times 15 = 60 \text{ Marks})$ 

- 11. State and explain Thevenins's theorem and Norton's theorem with help of neat circuit diagrams and their related expressions.
- 12. (a) A resistance of 10Ω is connected in series with an inductance of 0.05H and a capacitance of 300μF to a 100V, 1-φ ac supply. Calculate the magnitude and phase angle of the current when the frequency of the supply is (a) 25Hz (b) 50Hz.

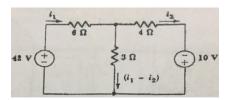
(b) A series RLC circuit containing a resistance of 12Ω, an inductance of 0.15H and a capacitor of 100uF are connected in series across a 100V, 50Hz supply. Calculate the total circuit impedance, the circuits current, power factor and draw the voltage phasor diagram.



- 13. (a) Derive the emf equation of 1-φ transformer.
  - (b) In a 25 kVA, 2000/200V transformer, the iron and copper losses are 350W and 400W respectively. Calculate the efficiency on unity power factor at (a) full load (b) half full load.
- 14. Explain in detail constructional details and principle of operation D.C Generator.
- 15. (a) Describe different types of cables used for domestic wiring.
  - (b) What do you understand by power factor? Explain the necessity of improving power factor?
- 16. (a) Calculate the effective resistance of the following combination of resistances and the voltage drop across each resistance when a potential difference of 60 volts is applied between points A and B.



(b) Solve for current in 3 ohm resistance in the circuit shown below using Thevenins theorem.



- 17.(a) The current in a series circuit of R=15 $\Omega$  and L=30mH and C=20 $\mu$ F. Determine the source frequency and impedance Z.
  - (b) What do you mean by 3-Ø balanced load?