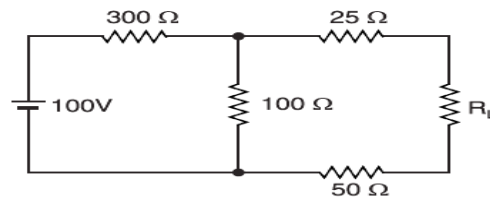


B.TECH
(SEM I) THEORY EXAMINATION 2022-23
BASIC ELECTRICAL ENGINEERING

Time: 3 Hours**Total Marks: 70****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.****7 x 2 = 14**

- (a) For ideal voltage & current source what will be the value of internal resistance.
- (b) Explain source transformation by suitable example.
- (c) An Alternating current is $i = 14.14 \sin 314t$ find its average, rms value.
- (d) Find out R_L to obtain max power.



- (e) Give two comparison of moving coil, dynamometer type instruments.
- (f) Why Iron loss also known as constant loss.
- (g) Give two comparisons between squirrel cage induction motor & slip-ring induction motor.

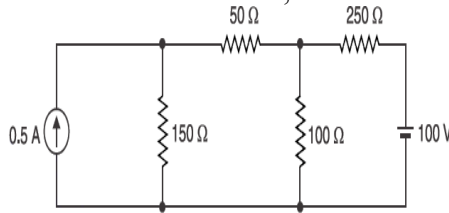
SECTION B**2. Attempt any three of the following:****3 x 7 = 21**

- (a) Explain Delta to Star and Star to Delta Conversion.
- (b) What are reasons / causes for low power factor, explain any one method to improve the power factor.
- (c) Write advantages of 3 phase starconnected systems, A 3-phase star connected load consists of three similar inductive coils of resistance of 20Ω and inductive reactance of 15Ω . The supply is 400 V, 50 Hz Calculate (i) the line current (ii) the power factor (iii) total power supplied.
- (d) Explain fringing of magnetic flux, magnetic leakage, and hysteresis and eddy current losses.
- (e) Explain Double Revolving Field Theory in 1 phase induction motor; also explain shaded pole method to start the motor.

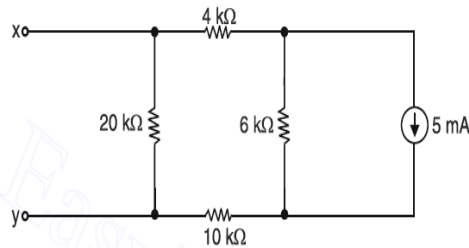
SECTION C

3. Attempt any *one* part of the following: 1 x 7 = 7

- (a) Using mesh analysis, find the currents in $50\ \Omega$, $250\ \Omega$ and $100\ \Omega$ resistors in the circuit shown below;



- (b) Find the Thevenin's equivalent circuit lying to the right of terminals x – y.



4. Attempt any *one* part of the following: 1 x 7 = 7

- (a) Explain form factor, peak factor; determine their value for full wave rectifier waveform.
- (b) A series R-L-C circuit consists of $R = 1000\ \Omega$, $L = 100\ \text{mH}$ and $C = 10\ \text{Pico farad}$. The applied voltage across the circuit is $100\ \text{V}$.
- (i) Find the resonant frequency of the circuit.
 - (ii) Find the quality factor of the circuit at the resonant frequency.
 - (iii) Find upper, lower cut off frequency.
 - (iv) Calculate the bandwidth of the circuit

5. Attempt any *one* part of the following: 1 x 7 = 7

- (a) Explain working principle of Permanent-Magnet Moving Coil (PMMC) Instruments, with advantages & disadvantages.
- (b) Explain the two-wattmeter method for determination of 3 phase power and power factor of three-phase load.

6. Attempt any *one* part of the following: 1 x 7 = 7

- (a) Draw BH curve; explain the eddy current losses and hysteresis losses, how these losses can be minimized.
- (b) In a $250\ \text{KVA}$ transformer has iron loss $1.8\ \text{KW}$, full load copper loss is $2000\ \text{W}$. Calculate the efficiency at full load & 0.8 power factor lagging. Determine also maximum efficiency at 0.8 power factor lagging.

7. Attempt any *one* part of the following: 1 x 7 = 7

- (a) Derive the expression of Generated EMF of DC Machine. Briefly explain what role Back EMF plays starting & running of motor.
- (b) Draw and explain the torque- slip characteristics of a three phase induction motor, what is effect of rotor resistance on torque- slip characteristics.