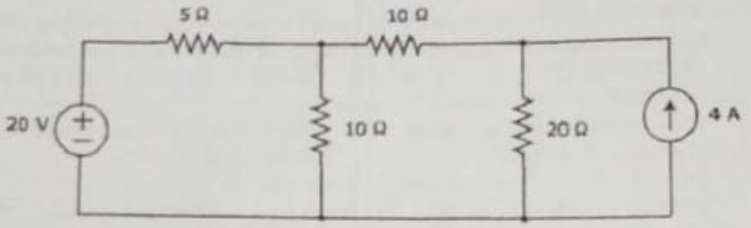
Alg sum of all volt & Volt drop in a closed circuit / path is eq. to zero : KVL
Alg sum of all currents meeting at a junction or a node is eq to zero : KCL.

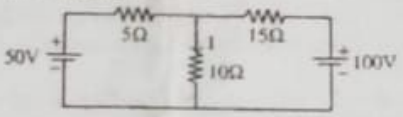
x. The time taken by an alternating quantity to complete one cycle: 1
(A) Time period (B) Frequency (C) Angular Velocity (D) Time constant

Q.2 i. State & Explain Kirchhoff's Law. 2
ii. Define the following: 3
i. Active Elements
ii. Passive Elements
iii. Energy sources

iii By using Nodal analysis, find the current in all branches of the network shown in the figure. 5



OR iv For the circuit shown in figure determine the current I through the 10Ω resistance by Thevenin's Theorem. 5



Q.3 i. Explain and derive the expression for Average value and RMS value for sinusoidal current 4

ii. A coil of resistance 10Ω & inductance 0.1H is connected in series with 150μF capacitor across a 200V, 50Hz supply. Calculate---- 6
(i) Inductive Reactance (ii) Capacitive Reactance (iii) Impedance
(iv) Current (v) Power factor (vi) Voltage across the coil

OR iii Define the following: 6
A) Cycle
B) Time period – Time taken by an alternating quantity to complete 1 cycle
C) Frequency – no. of cycles per second Hertz $f = 1/T$
D) Amplitude – Peak max. value of an alternating quantity
E) Lagging current by angle φ
F) Leading current by angle φ

1 complete +ve & -ve half of any alternating quantity

Total No. of Questions: 4

EN21C8304039

Enrollment No.....

Faculty of Engineering

Mid Sem I Examination April -2022

EN3ES17 Basic Electrical Engineering

Programme: B.Tech. Branch/Specialisation: All

Duration: 2 Hrs. **Maximum Marks: 40**

Q.1 i. When two resistors are connected in series total resistance is 16Ω and when connected in parallel, equivalent resistance is 4Ω. Values of resistances are: 1

(A) 11Ω and 5Ω (B) 12Ω and 4Ω (C) 8Ω and 8Ω (D) 15Ω and 1Ω

ii. Kirchhoff's laws are useful in determining—— 1

(A) Current flowing in a circuit (B) EMFs and Voltage drops in a circuit

(C) Power in a circuit (D) All the above

iii In a DC Circuit, Inductive reactance would be_____ 1

(A) Equal As in AC Circuits (B) High (C) Extremely High (D) Zero

iv In order to determine the thevenin's voltage across the load, the load terminal gets- 1

(A) Open Circuited (B) Short circuited

(C) Either (a) or (b) (D) Neither (a) nor (b)

v. According to Thevenin's theorem, any bilateral network can be replaced by a network with—— 1

(A) An independent current source in parallel to the equivalent resistance

(B) An independent voltage source in series with the equivalent resistance

(C) An independent voltage source in parallel to the resistance

(D) None of these

vi In sinusoidal wave, RMS value = ___ x Maximum value 1

(A) 0.636 (B) 0.85 (C) 0.607 (D) 0.707

vi The voltage and current relationship for inductor of inductance L is given as- 1

(A) $v(t) = i(t)*L$ (B) $v(t) = \frac{1}{L}\frac{di(t)}{dt}$

(C) $v(t) = L\frac{di(t)}{dt}$ (D) None of the above

vi Two sinusoidal quantities are said to be phase quadrature, when their phase difference is 1

(A) 0° (B) 30° (C) 45° (D) 90°.

ix A 100 μF capacitor supplied from 3 V source with a frequency of 50 Hz. The capacitive reactance is 1

(A) 63.68 Ω (B) 15.92 Ω (C) 31.84 Ω. (D) 7.96 Ω.

$X_c = \frac{1}{2\pi fC} = \frac{1}{2 \times 3.14 \times 50 \times}$