Sub Code:REE101

Paper Id: 120102 Roll No:

B.TECH
(SEM I) THEORY EXAMINATION 2019-20
BASIC ELECTRICAL ENGINEERING

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

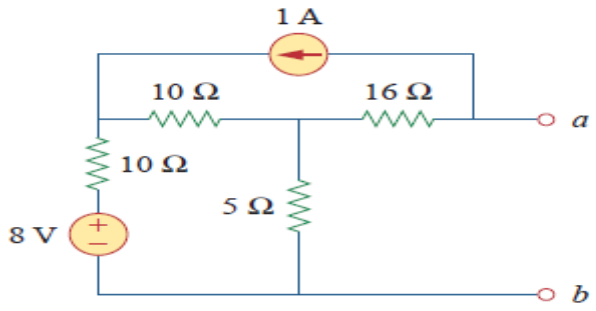
1. Attempt *all* questions in brief. 2 x 7 = 14

a. Three resistor 2Ω, 4Ω, 5Ω are connected in delta Determine its equivalent Star connection.
b. Define Form Factor and Peak Factor.
c. $V_1 = 50 \text{ Sin } 50 \text{ t}$ and $V_2 = 30 \text{ Sin } (50 \text{ t} - \pi/4)$. Illustrate by phasor diagram.
d. What is the major difference between PMMC type and dynamometer type of instruments?
e. Compare star connection with delta in 3 phase system.
f. Why dc series motor is never started on No load?
g. Write different methods of starting single phase induction motor.

SECTION B

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

a. Obtain the Thevenin equivalent at terminals of the circuit given below-



b. Explain with neat diagram, working principle of Moving Iron type electrical measuring instruments also write advantages and disadvantages.

c. A sinusoidally varying alternating current of frequency 50 Hz has a maximum value of 10 amperes:
(i) Write down the equation for instantaneous value. (ii) Find the value of current after 1/100 second. (iii) Find the time to reach 7 amp for the first time and (iv) Find its average value

d. Explain the two-wattmeter method for determination of power and power factor of three-phase load with suitable diagram.

e. Explain principle of operation of three phase induction motor. Draw the torque-slip characteristics of a three phase induction motor.

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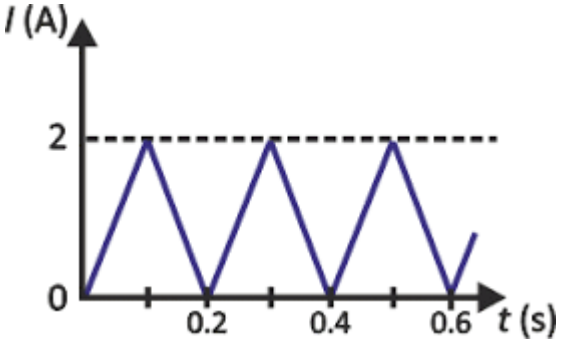
SECTION C

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

(a) Find the Average value and RMS value of the following wave.



(b) A circuit consists of three parallel branches. The branch currents are represented by $i_1 = 10$ Sin wt, $i_2 = 20$ Sin $(wt + 40^0)$, $i_3 = 7.5$ Sin $(wt - 45^0)$. Find the resultant current and express it in the form $i=i_m$ Sin $(wt+\varphi)$.

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

(a) Give the relationship between quality factor, resonant frequency and bandwidth for a series R-L-C Circuit.

(b) Why power factor improvement is required, explain any method to improve power factor.

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

(a) Explain the principle of operation of attraction type of moving iron instruments. A moving coil instrument gives a full scale deflection of 30 mA when a potential difference of 70 mV is applied. Calculate the series resistance to measure 750V on Full scale.

(b) A 3-phase star connected balanced load is supplied 400 V, 50 Hz. The load takes a leading current of 1.732 A and power 20 KW. Calculate power factor of the load, resistance and inductance per phase.

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

(a) List the various losses that occur in transformer. Derive the condition of maximum efficiency.

(b) Write analogy between Magnetic circuit and electric circuit.

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

(a) Derive EMF equation of DC Machine; explain with the help of neat diagram the different types of DC motors.

(b) Explain working principle of synchronous motor and write its specific applications.