Roll No. .....

24007

B. Tech. 2nd Semester "F Scheme" Examination – May, 2010

ELECTRICAL TECHNOLOGY

Paper : EE-101-F

Time : Three hours] *[Maximum Marks : 100*

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all Question no. **1** is compulsory. All questions carry equal marks.

1. (a) State and explain ohm's law. 3

(b) State Milliman's theorem. 3

(c) Differentiate between rms & average value of signal. 3

(d) What is Q-factor of a circuit. 3

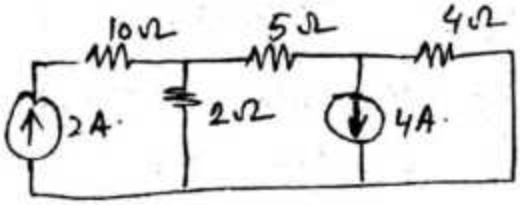
(e) Differentiate between phase & line voltages in three phase circuits. 3

(f) What are eddy currents ? 3

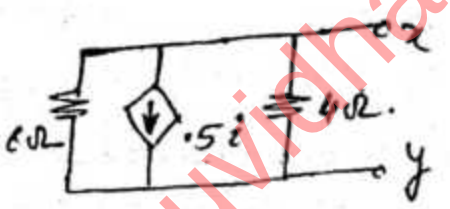
(g) What is the internal resistance of a ammeter ? 2

2. (a) Derive expressions for converting STAR circuit to Delta circuit. 10

(b) Find the current through 5Ω resistor. 10



3. (a) Find Norton's equivalent circuit to the left of terminal x-y in the Fig. shown. 10



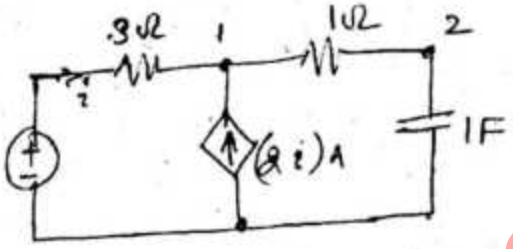
(b) State and explain reciprocity theorem. Derive results for it. 10

4. (a) A direct voltage of 200V is suddenly applied to a series LR circuit having R = 20Ω and inductance 0.2H. Determine the voltage drop across the inductor at the instant of switching on and at 0.02 sec later. 10

(b) Derive an expression for transient response in series R.C circuit with sinusoidal excitation. 10

5. (a) Derive the expression of resonance frequency and impedance in case of parallel RLC circuit. 10

(b) Find the voltage of the capacitor at $t = 0+$ assuming no charge stored in the capacitor at $t = 0$. 10



6. (a) A rms voltage in a three phase star circuit is given by 231V (ph-N). Write the instantenous voltage expression. If the current in each phase lag the corresponding phase voltages by 30°, what are the expressions of instantenous currents. 10

(b) Explain the circuit used for the measurement of three phase power by two wattmeter method. Derive expressions for it. 10

7. (a) Draw the phasor diagram for the transformer at resistive, inductive and capacitive loads. 10

(b) Explain the open and short circuit test of transformer. 10

8. (a) Draw and explain the construction and working of induction motor. 10

(b) What are synchronous machines ? Draw their block diagram and explain their working. 10

9. Write short notes on : 20

(i) Watt meter,

(ii) Energy meter.