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B. Tech. 1st Semester F-Scheme Examination,

December–2014

ELECTRICAL TECHNOLOGY

Paper–EE–101 F

Time allowed : 3 hours]

[Maximum marks : 100

Note : (1) Attempt a total of five questions.

(2) Question No. 1 is compulsory. One question to be attempted from each unit.

(3) The sub parts of questions should be attempted together only.

1. (a) Importance of power factor and how it is calculated. 4×5
- (b) Explain KCL with diagram.
- (c) How OC test of transformer is conducted ?
- (d) Difference between Star and Delta 3 phase configuration.
- (e) Difference between DC motor and Generator.

(2)

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Unit-I

2. (a) Using mesh current method, determine current I_1, I_2, I_3 in the given circuit shown in diagram 2.1.

10

- (b) Using star/delta transformation find out current supplied by the battery in the circuit as shown in diagram 2.2 ($R = 1\Omega$)

10

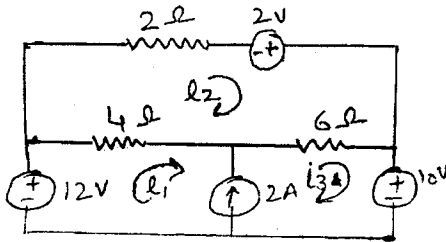


Fig. 2.1

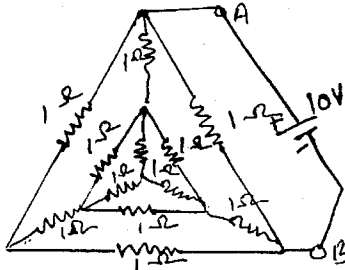


Fig. 2.2

3. (a) State and prove the maximum power transform theorem.

10

(3)

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- (b) For the NW shown in the figure 3.2 derive Thevenin's equivalent circuit and find voltage through 2Ω resistance. 10

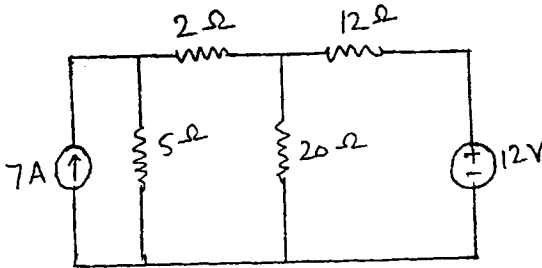


Fig. 3.2

Unit-II

4. (a) An AC of frequency of 50 Hz has maximum value of 100 A. Calculate
- its value $1/600$ seconds after the instant the current is zero
 - In how many seconds after the zero value the current attains the value of 86.6 A. 10
- (b) Two coils A and B are connected in series across a 240 V, 50 Hz supply. The resistance of A is 5Ω and the inductance of B is 0.015 H. If the input from the supply is 3 kW and 2 kVAR, find the inductance of A and resistance of B. Also calculate the voltage across each coil. 10

5. Two impedance $Z_1 = (6-j 8) \Omega$ and $Z_2 = (8-j 6) \Omega$ are in parallel across 100 V supply. Determine
- (i) current and power factor of each branch
 - (ii) overall current and power factor
 - (iii) power consumed by each branch and total power consumed. 7+7+6

Unit-III

6. Explain voltage regulation for a transformer and also determine conditions for zero regulation. Also derive EMF equation for the transformer. 14+6
7. (a) Derive the expression for measurement of power using two watt meter method. 10
- (b) Establish relation between the Line and phase voltage of both 3 phase star connected circuit. 10

Unit-IV

8. Explain construction, principle, working, EMF equation and losses of induction motor. Also draw a suitable diagram. 20
9. Write short notes on : 10×2
- (a) Energy meter.
 - (b) Moving coil type ammeter.