



MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY,
JAMSHORO.

ID.No./Seat No. **10EC13**

FIRST TERM SECOND YEAR (3rd TERM) B.E.(ELECTRICAL) REGULAR EXAMINATION 2011 OF 10-BATCH.

LINEAR CIRCUIT ANALYSIS

Date: 18-05-2011

Time Allowed: 03 Hours.

Max: Marks-80.

NOTE: ATTEMPT ANY FIVE QUESTIONS.

Q.No.

Marks

- 01 (a): Define the following terms [08]
 (i) Circuit (ii) Linear circuit (iii) Active elements (iv) Parametre
 (v) Passive element (vi) Bilateral circuit (vii) unilateral circuit (viii) Active network

- 01 (b): Calculate the indicated currents and voltage of Fig1 [08]

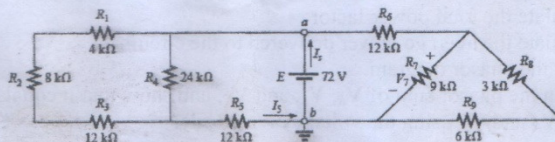
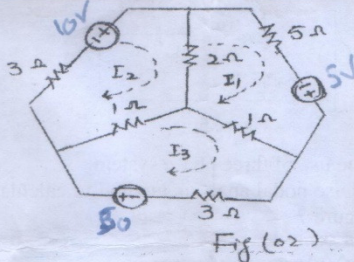


Figure 1

- 02 (a): State and explain Kirchhof's Laws with its applications as applied to electrical circuits. [08]

- 02 (b): Use mesh analysis method to calculate mesh current for the network as shown in fig.2. [08]



- 03 (a): State superposition theorem and by using superposition theorem, find the current I through the 4ohm reactance (X_{L2}) of Fig.3(a) [08]

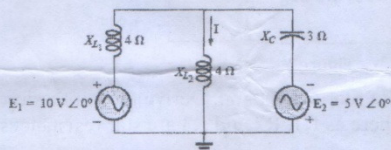


Figure 3(a)

- 03 (b): State maximum power transfer theorem and For the network of Fig. 3(b), determine the value of R for maximum power to R, and calculate the power delivered under these conditions. [08]

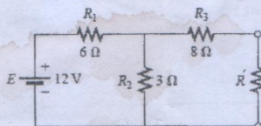


Figure 3(b)

Cont'd on P/-2....

04 (a): Explain Thevenin's and Norton's theorem [08]

04 (b): Calculate the value of current through R_L by using thevenin's theorem when R_L takes the value of $2K\Omega$ for the network of figure 4 [08]

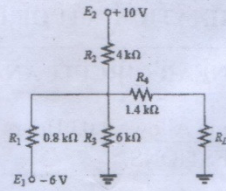


Figure 4

05: For the circuit of Fig. 5:

[16]

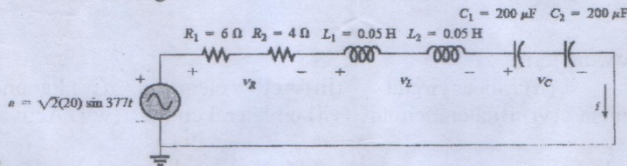


Figure 5

- Calculate I , V_R , V_L , and V_C in phasor form.
- Calculate the total power factor.
- Calculate the average power delivered to the circuit.
- Draw the phasor diagram.
- Obtain the phasor sum of V_R , V_L , and V_C , and show that it equals the input voltage E .
- Find V_R and V_C using the voltage divider rule.

06 (a): Explain the advantages of star and delta connected system [06]

06 (a): Find the Norton equivalent circuit for the network external to the 7Ω capacitive reactance in Fig. 6 [10]

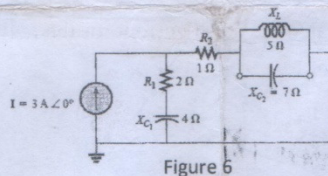


Figure 6

07 (a): Describe the reasons for the use of three phase system [06]

07 (b): Define nodal analysis and use nodal analysis method to calculate node voltage and also verify KCL for the network of figure 7 [10]

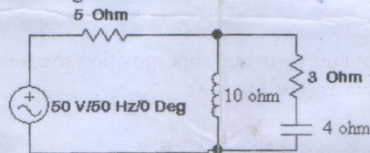


Figure 7

08 (a): Explain the method of Delta/Star conversion. Derive the expression for R_a , R_b and R_c in terms of R_1 , R_2 and R_3 where as R_1 , R_2 and R_3 are star resistances and R_a , R_b and R_c are delta resistances. [08]

08 (b): Obtain the equivalent impedance and current taken from the source of the network as shown in fig.(8). [08]

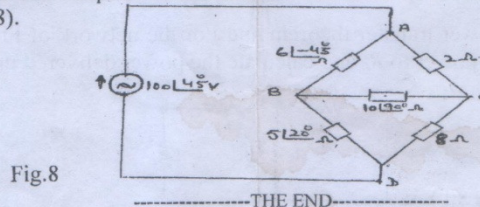


Fig.8

-----THE END-----