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Question Paper Code : 31390

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Second Semester

Electrical and Electronics Engineering

EE 2151/EE 25/EE 1151/080280005/10133 EE 205 — CIRCUIT THEORY

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

(Regulation 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Kirchoff's voltage law.

2. Explain the concept of current division in a circuit.

3. Write the objective of star delta transformation.

4. Define Reciprocity theorem.

5. Write the significance of quality factor.

6. Write the empirical formula for coefficient of coupling in coils.

7. What is meant by transient time?

8. Write the purpose of Laplace transformation in the circuit analysis.

9. What are the advantages of three phase system?

10. Write the current relations in star and delta connections of a three phase circuit.

PART B — (5 × 16 = 80 marks)

11. (a) In the circuits of Fig. 1, find the current I by the mesh method. (16)

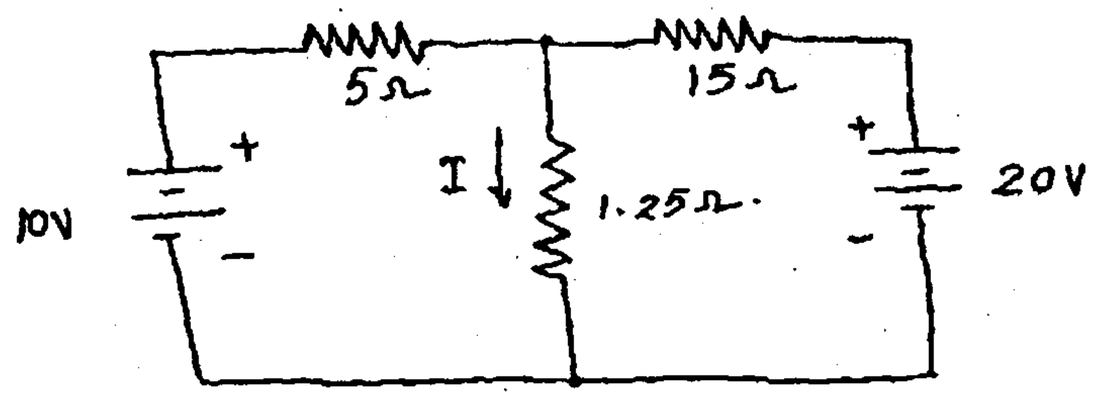

Fig. 1

Or

(b) Write the nodal equations for the network of Fig. 2. Hence find the potential difference between nodes 2 and 4. (16)

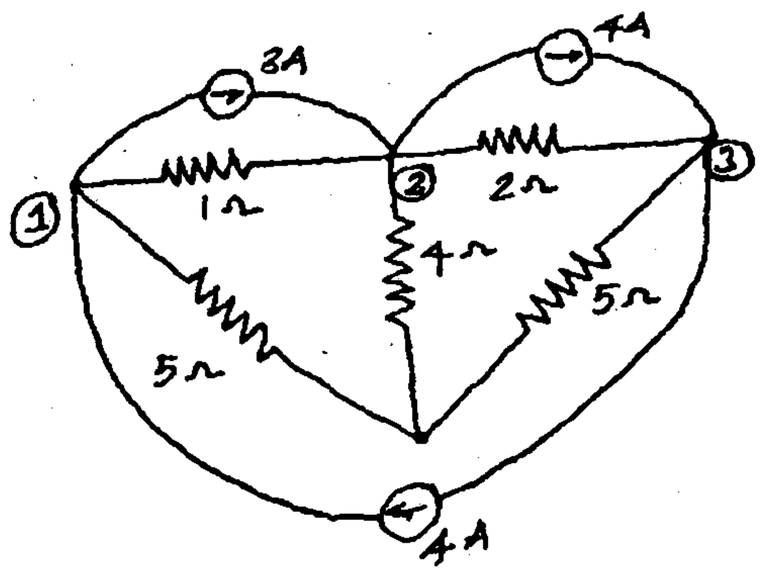

Fig. 2

12. (a) Using star-delta transformation, in the following wheat stone bridge circuit of Fig. 3, find (i) the equivalent resistance between P and Q (ii) the total current and (iii) the current through the 18Ω resistor. (16)

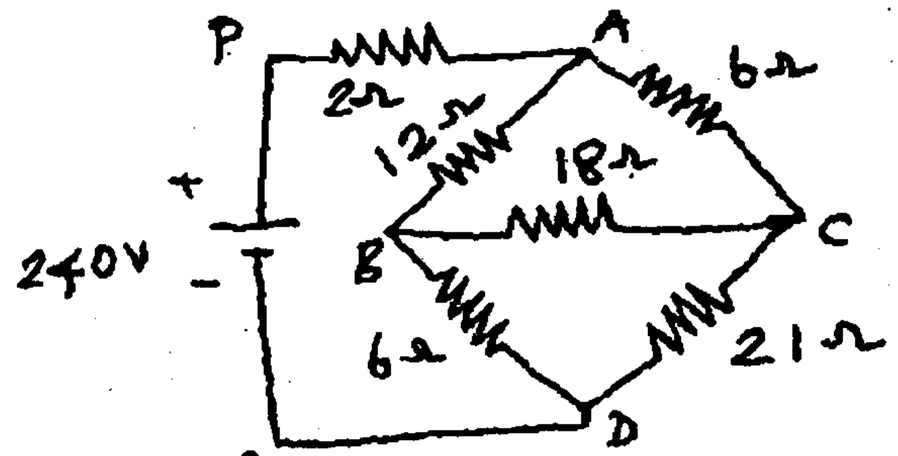

Fig. 3

Or

(b) Find the current through the 10Ω resistor in Fig. 4. Using Thevenin's theorem. (16)

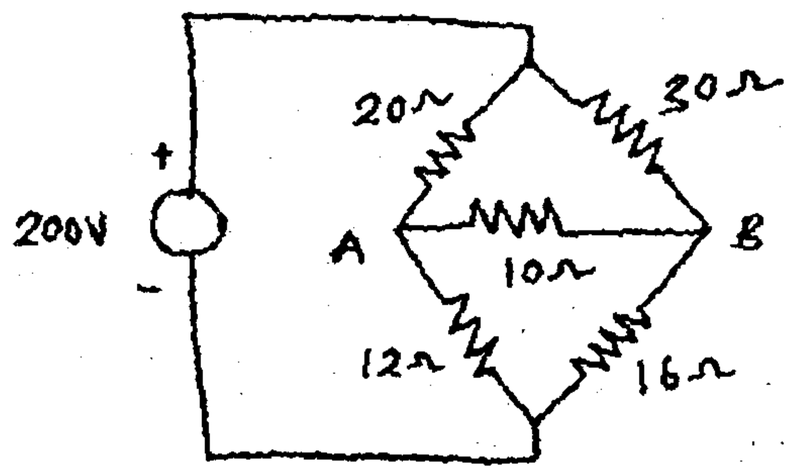

Fig. 4

13. (a) A RLC series circuit has R = 60Ω, L = 160mH and C = 160μf. Find the resonant frequency under resonant condition obtain the current, power and the voltage drops across the various elements if the applied voltage is 300 V. (16)

Or

(b) Illustrate the amplification factor with respect to frequency and coefficient of coupling of a single tuned circuit in detail. (16)

14. (a) In the series RL circuit shown in Fig. 5, the switch is closed on position 1 at t = 0. At t = 1 milli-second, the switch is moved to position 2. Obtain the equations for the current in both intervals and draw the transient current curve. (16)

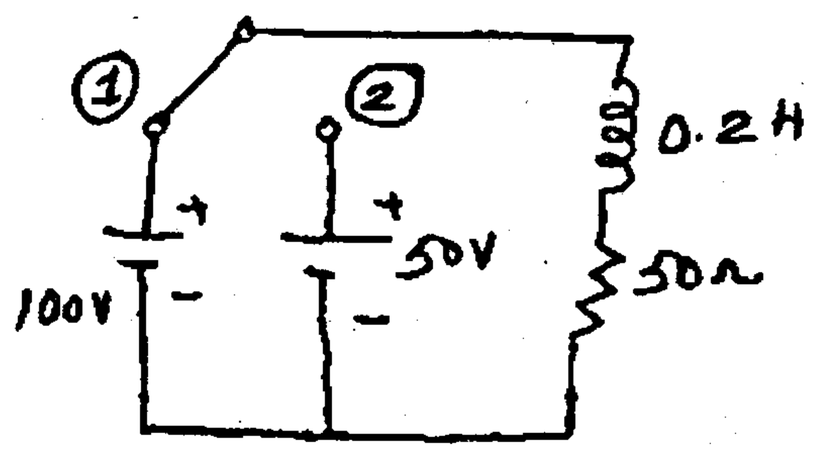

Fig. 5

Or

(b) In the Fig. 6, find the current. Assume initial charge on the capacitor is zero. (16)

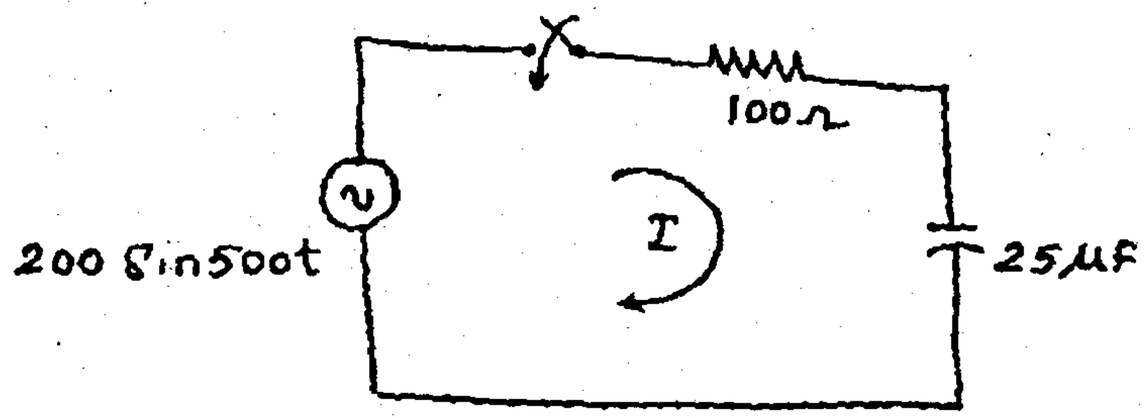

Fig. 6

15. (a) Explain the behaviour of unbalanced loads in three phase system. (16)

Or

(b) Describe about various methods to measure the real power and power factor in the three phase circuit. (16)