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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech II Semester End Examinations (Regular) - May, 2017

Regulation: IARE – R16

FUNDAMENTAL OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Common for CSE/IT)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) Differentiate between [7M]
 - i. voltage and current source
 - ii. active and passive elements.

- (b) A dc circuit comprises of two resistors; resistor A of value 25 ohm and resistor B of unknown value, connected in parallel, together with a third resistor C of value 5 ohm, connected in series with the parallel branch. Find the voltage to be applied across the whole circuit and the value of the resistor B if the potential difference across C is 90V, and the total power consumed is 4320W. [7M]

2. (a) Find the value of R shown in figure 1, such that the power dissipated in the 5Ω resistor is 100W. Assume that the internal resistance of the battery of 50V is 1Ω. [7M]

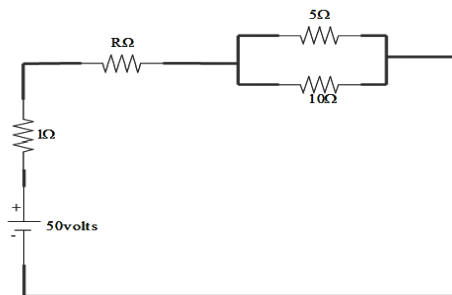


Figure 1

- (b) A voltage $v=10 \sin 314t$ is applied to an inductance of 5mH. Determine i , instantaneous power p and average power p_{avg} . [7M]

UNIT – II

3. (a) Find the voltage across 1Ω resistor and current through 2Ω resistor for the circuit shown in figure 2 using nodal method. [7M]

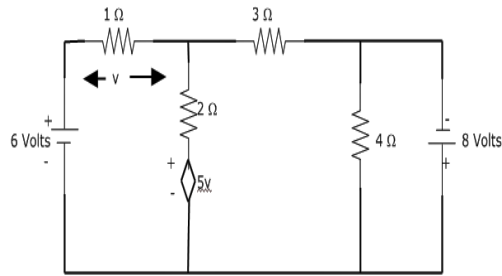


Figure 2

- (b) State and explain Thevenin's and Norton's theorems using any example. [7M]
4. (a) Define and explain the following terms: [6M]
- i. Twigs
 - ii. Co-tree
 - iii. Links
 - iv. Branch.
- (b) Determine the basic cutset matrix for the oriented graph given in figure 3 where in the elements 1,2 and 3 are tree branches. [8M]

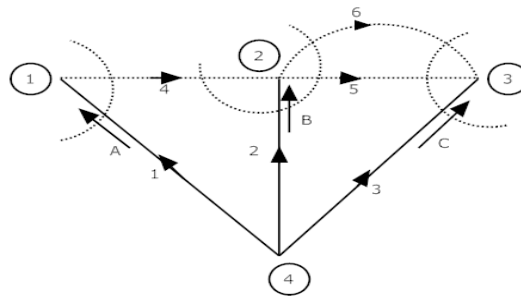


Figure 3

UNIT – III

5. (a) Derive the delta – star transformation of a resistive network. [7M]
- (b) Explain how reactive power could be measured in a three phase circuit using single wattmeter method. [7M]
6. (a) A choke coil has a resistance of 2 ohm and inductance of 5H. A capacitor C is connected in series with the choke coil and the combination is fed from a 230V, 50Hz supply. What should be the value of C so that the voltage across the choKе coil is 250V. [7M]
- (b) Explain the power measurement methods in [7M]
- i. balanced three phase loads
 - ii. unbalanced three phase loads.

UNIT – IV

7. (a) Prove that the ripple factor for the full wave rectifier circuit is 0.48. [7M]

- (b) What are the advantages and disadvantages of a full wave rectifier circuit? [7M]
8. (a) Explain the operation of a zener diode as a voltage regulator with its connection diagram and characteristic curve. [7M]
- (b) Compare a full wave bridge rectifies with a full wave rectifies with two diodes (with centre tapped transformer). Define PIV of the rectifier. [7M]

UNIT – V

9. (a) Explain the need for biasing the transistor. [7M]
- (b) Explain the operation of a npn CE amplifier. Draw its input and output characteristics. [7M]
10. (a) Explain the working of a transistor as an amplifier. Mention the different configurations of transistor amplifier. [7M]
- (b) Explain the operation of a common collector npn transistor. Mention any one application of it. [7M]

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