



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

B.Tech II Semester End Examinations (Supplementary) - July, 2018
Regulation: IARE – R16

FUNDAMENTAL OF ELECTRICAL AND ELECTRONICS ENGINEERING

Time: 3 Hours(Common to CSE | IT)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) State and explain Kirchhoff's laws with an example. [7M]
- (b) Calculate the voltage that is to be connected across terminals X-Y in Figure 1 such that the voltage across the 2Ω resistor is 10V. Also find I_a and I_b . [7M]

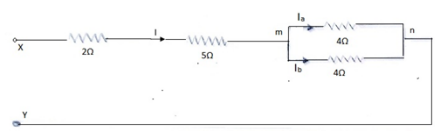


Figure 1

2. (a) Prove that the energy stored in a capacitor $E_L = 0.5LI^2$. [7M]
- (b) Derive an expression for finding the equivalent capacitance when 'n' capacitors are connected in series. [7M]

UNIT – II

3. (a) Define and explain the following terms: (i) Twigs (ii) Co-tree (iii) Links (iv) Branch. [7M]
- (b) Determine the basic cutset matrix for the oriented graph given in Figure 2 where in the elements 1,2 and 3 are tree branches. [7M]

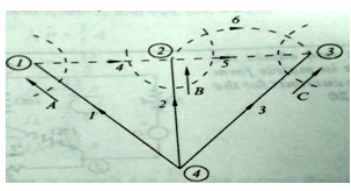


Figure 2

4. (a) State Super position theorem and explain it with a suitable example. [7M]
 (b) Using Thevenin's theorem, determine the current through load impedance $Z_L = 5-j5$ of the network shown in Figure 3. Find the power consumed by the load. [7M]

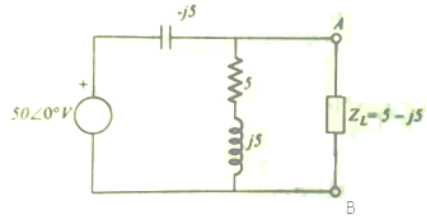


Figure 3

UNIT – III

5. (a) Obtain the relationship between line and phase quantities of voltage and current in a balanced three phase star connected system. [7M]
 (b) A coil having resistance of 5Ω and inductance of 30mH in series are connected across a 230V , 50Hz supply. Calculate the current, power factor and power consumed. [7M]
6. (a) Derive an expression to find the bandwidth of a series RLC circuit. [7M]
 (b) Find the value of 'C' to have a resonant frequency of 4500 rad/sec for the network shown in Figure 4. [7M]

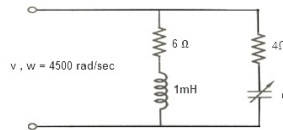


Figure 4

UNIT – IV

7. (a) Explain the various breakdown mechanisms present in a p-n junction when a reverse bias is applied. [7M]
 (b) With a neat diagram explain the working principle of a full wave bridge rectifier. Mention its value of ripple factor and PIV. [7M]
8. (a) Draw the circuit diagram of a full wave rectifier. Explain the operation of the circuit with relevant waveforms. [7M]
 (b) Explain the working of a Diode as a switch and Zener diode as a voltage regulator. [7M]

UNIT – V

9. (a) List the comparison between CB, CC and CE amplifiers. [7M]
 (b) Explain the working of a PNP transistor. [7M]
10. (a) Explain the constructional details of a BJT. [7M]
 (b) Calculate the α_{dc} and β_{dc} for the given transistor for which $I_c = 5\text{mA}$, $I_B = 50\mu\text{A}$ and $I_{CO} = 1\mu\text{A}$. [7M]