Hall Ticket No | | | | | | | | | | | Question Paper Code: AEE005

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech III Semester End Examinations (Supplementary) - February, 2018

Regulation: IARE – R16

NETWORK ANALYSIS

(Electrical and Electronics Engineering)

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) A three phase, balanced delta connected load of 4+j8 Ω is connected across a 400 V, three phase balanced supply. Determine the phase currents and line currents. Assume the phase sequence to be RYB? **[7M]**

   (b) Explain in detail the star delta method of solving unbalanced load? **[7M]**

2. (a) The input power to a three phase load is 10 kW at 0.8 pf. Two wattmeters are connected to measure the power, find the individual readings of the wattmeters? **[7M]**

   (b) An unbalanced four wire, star connected load has a balanced voltage of 400V, the loads are Z_1 = 4+j8 Ω, Z_2 =3+j4 Ω and Z_3 = 15+j20 Ω Calculate the **[7M]**
   (a) Line currents
   (b) Current in the neutral wire?

UNIT – II

3. (a) In the circuit shown in Figure 1 switch is closed at t=0+ Find the value of I, di/dt, d^2i/dt^2.**[7M]**

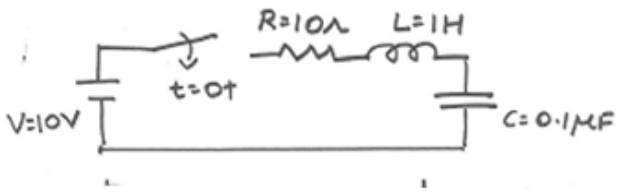

Figure 1

(b) In the circuit shown in Figure 2, switch is open at t=0+. Find the values of V, dv/dt, d^2v/dt^2. **[7M]**

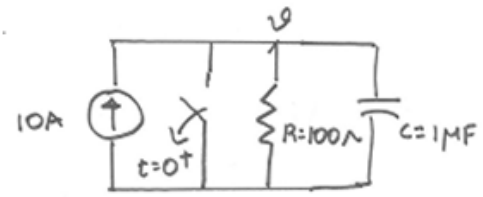

Figure 2

4. (a) Determine the voltage V(t) shown in Figure 3, when the switch is opened at t=0 +using Laplace transform method. **[7M]**

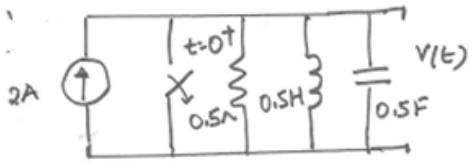

Figure 3

(b) In the network shown in Figure 4, the switch is opened at t=0+. Find the steady state value of I(t) using Laplace transform method. **[7M]**

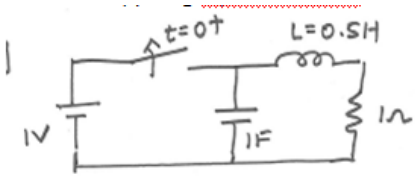

Figure 4

UNIT – III

5. (a) For the circuit shown in Figure 5 if the reactance is variable, plot the range of I for maximum and minimum values of X_L and maximum power consumed in the circuit? **[7M]**

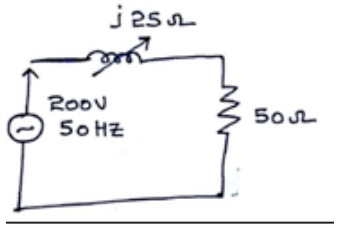

Figure 5

(b) For the network shown in Figure 6 obtain the transfer functions G_{21}(S) and Z_{21}(S) and the driving point impedance Z_{11}(S)? **[7M]**

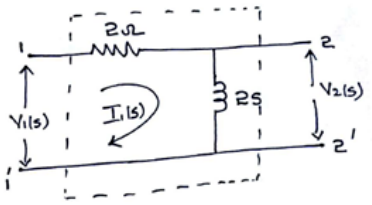

Figure 6

6. (a) Draw the locus diagrams for the following **[7M]**
   i. Fixed R and variable L circuit
   ii. Fixed R and variable C circuit.

   (b) Plot the current locus for the circuit with R = 50Ohms and X_c = 25Ohms with variable C. Find the power consumed with a supply voltage of 200V, 50HZ. **[7M]**

UNIT – IV

7. (a) Determine Y parameters for the following network shown in Figure 7. **[7M]**

Figure 7

   (b) Determine the transmission(ABCD) parameters in terms of short circuit(Y) parameters. **[7M]**

8. (a) Two networks are connected in series shown in Figure 8. Obtain the Z-parameters of the combination. Also verify by direct calculation? **[7M]**

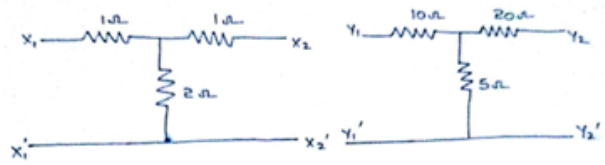

Figure 8

   (b) Find the h-parameters of the network shown in Figure 9? **[7M]**

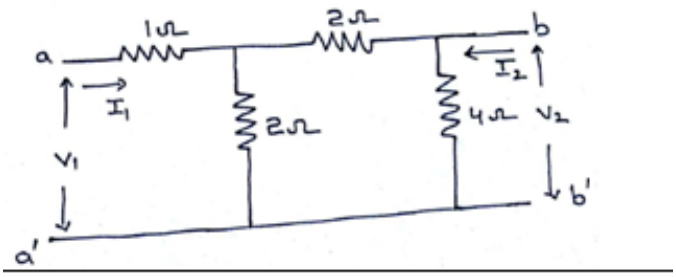

Figure 9

UNIT – V

9. (a) Derive the propagation constant of a symmetrical T network. **[7M]**

   (b) Design m derived low pass T filter having a cut off frequency of 1kHZ, design impedance of 400ohms and resonant frequency of 1100Hz. **[7M]**

10. (a) Classify the various types of filters and derive the design equations of a K type low pass filter. **[7M]**

    (b) Design a k type band stop T filter having design impedance of 600ohms and cut off frequency of 2kHz and 6kHz. **[7M]**

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