Code: 9A02401 **R09**

B.Tech II Year II Semester (R09) Supplementary Examinations December/January 2015/2016

PRINCIPLES OF ELECTRICAL ENGINEERING

(Common to EIE, E.Con.E, ECE & ECC)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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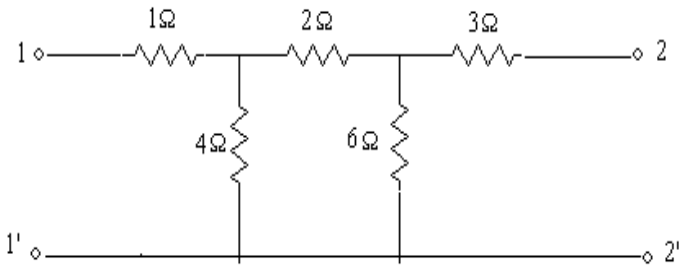
1 (a) Derive the expression for current when a dc voltage V is applied suddenly (i.e. at time = 0) by closing a switch in a series R-C circuit

(b) In a series R-L circuit, the application of a direct voltage results a steady state current of 0.6321 in 1 second. 'I' being the final steady state value of the current. However, after the current has reached its final value, a sudden short circuit is applied against the source. What would be the value of the current after one second?

2 (a) Define and obtain Impedance parameters by taking any one example.

(b) Obtain 'Y' – parameters for the given network shown below.



3 Design an m-derived low pass filter having design resistance R_0 = 500 Ω, cut-off frequency f_c = 1500 Hz and infinite attenuation frequency f_α = 2000 Hz.

4 What is an attenuator? Derive the design equations for Bridged T-type attenuator.

5 (a) Explain the principle of operation of DC generator.

(b) A 6 – pole, Lap wound armature has 840 conductors and flux per pole of 0.018 Wb. Calculate the emf generated when the machine is running at 600 rpm.

6 A 220 V, shunt motor takes 4 A on no–load. The resistance of the armature including the brushes is 0.1 ohm and the field current is 1 A. Estimate the output and the efficiency when the input current is 50 A.

7 (a) Discuss the constructional details of a shell type transformer.

(b) A 5 kVA, 200/400 V, 50 Hz single phase transformer gave the following results:
OC test: 220 V, 0.7 A, 60 W on LV side
SC test: 22 V, 10 A, 120 W on HV side
Determine the efficiency of transformer at full load having a load power factor of 0.8 lagging.

8 (a) Explain the principle of operation of Synchros.

(b) Explain the characteristics of Stepper motor.