Code: 9A02401 **R09**

B.Tech II Year II Semester (R09) Supplementary Examinations May/June 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) A dc voltage of 100 V is applied to a coil having R = 10 Ω and L = 10H. What is the value of the current 0.1 sec. later the switching on? What is the time taken by the current to reach half of its final value?

2 (a) Define ABCD parameters. Explain how the ABCD parameters can be obtained for a given two port network.

(b) A two port network has the following parameters: Z_{11} = 6 Ω, Z_{12} = Z_{21} = 3 Ω and Z_{22} = 4 Ω. Calculate Short circuit parameters.

3 Design an m-derived low pass filter having design resistance R_0 = 600 Ω, cut-off frequency f_c = 1800 Hz and infinite attenuation frequency f_α = 2400 Hz.

4 What is an attenuator? Explain Lattice attenuator and Bridged T-type attenuator by deriving necessary equations.

5 (a) Explain the operating principle of a DC generator in detail.

(b) A 4 – pole wave connected DC generator having 60 slots on its armature with 6 conductors per slot, runs at 750 rpm and generates an open circuit voltage of 230 V. Find the useful flux per pole.

6 Define the efficiency of a d.c machine and also derive the expressions for efficiency when the machine running as a motor and as a generator.

7 Draw an approximate equivalent circuit of a transformer and derive an expression for its regulation.

8 (a) Explain the principle of operation of Stepper motor.

(b) Explain the characteristics of AC servo motor.

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