

**Code: 9A02401****B.Tech II Year II Semester (R09) Supplementary Examinations May/June 2016****PRINCIPLES OF ELECTRICAL ENGINEERING**

(Common to EIE, E.Con.E, ECE &amp; 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  $R = 10 \Omega$  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:  $Z_{11} = 6 \Omega$ ,  $Z_{12} = Z_{21} = 3 \Omega$  and  $Z_{22} = 4 \Omega$ . Calculate Short circuit parameters.
- 3 Design an m-derived low pass filter having design resistance  $R_0 = 600 \Omega$ , cut-off frequency  $f_c = 1800$  Hz and infinite attenuation frequency  $f_\alpha = 2400$  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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