

Code: 9A02406

R09

B.Tech II Year II Semester (R09) Supplementary Examinations May/June 2016

NETWORK THEORY

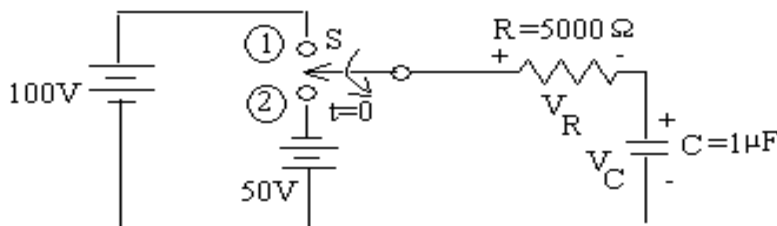
(Electrical & Electronics Engineering)

Time: 3 hours

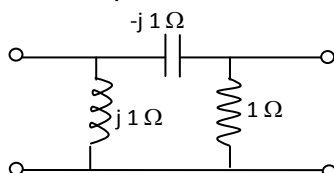
Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Derive the relation between phase and line values of a three phase delta connected balanced system.
(b) Three inductive coils, each with a resistance of 15Ω and an inductance of 0.03 H are connected in star to three phase, 400 V , 50 Hz supply. Calculate: (i) Phase current and line current. (ii) Total power absorbed.
- 2 A $3\text{-}\Phi$ 400 V load has p.f of 0.6 lagging. The two wattmeters read a total input of 20 kW . Find the readings of each wattmeter. Derive the expression for power factor.
- 3 The switch in the circuit shown in figure below, is moved from position (1) to (2) at $t = 0$. Find the expression for V_C and V_R for $t > 0$.



- 4 Derive the expression for $i(t)$ in a series R-C circuit is excited with a sinusoidal voltage source $V = V_m \sin(\omega t + \Phi)$, when the switch is closed at time $t = 0$.
- 5 Construct a circuit that realizes the following parameters:
$$[Z] = \begin{bmatrix} 10 & 4 \\ 4 & 6 \end{bmatrix}$$
- 6 Determine the Z-parameters of the two-ports shown below:



- 7 Obtain the exponential Fourier series for $f(t) = t$, $-1 < t < 1$ with $f(t + 2n) = f(t)$.
- 8 Calculate the fraction of the total energy dissipated by a 1Ω resistor in the frequency band $-10 < \omega < 10$ rad/sec when the voltage across it is $v(t) = e^{-2t} u(t)$.
