

Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) Obtain the behavior of an RLC circuit when  $t = 0$  and  $t = \infty$ .  
b) Write the loop equations for the network shown in figure 1.

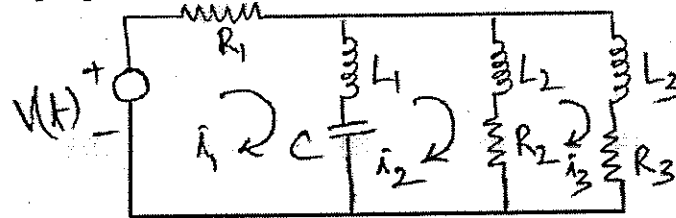


Figure: 1

- 2.a) For a passive two port network, list out the various two port parameters and their defining equations. Write the equations for transmission line parameters (A, B, C, D).  
b) Find the A, B, C, D parameters of the network shown in figure 2.

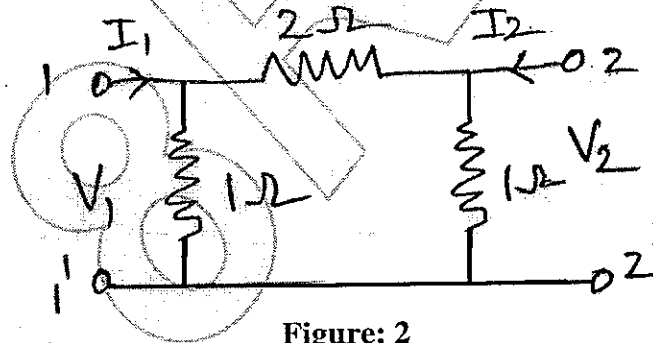


Figure: 2

- 3.a) Explain the characteristics of a filter and what is the nature of characteristic impedance in pass and stop bands?  
b) A low pass  $\pi$  section filter consists of an inductance of 25mH in the series arm and two capacitors of  $0.2 \mu\text{F}$  in the shunt arms. Calculate the cut off frequency, design impedance, attenuation at 5 kHz and phase shift at 2 kHz.
4. Write notes on T-type and  $\pi$ -type attenuators.
- 5.a) Derive the emf equation of a DC generator.  
b) Draw the magnetization and load characteristics of DC generators.  
c) A 4 pole DC shunt generator having a field and armature resistance of  $100 \Omega$  and  $0.2 \Omega$  respectively supplies parallel connected 100 number of 200 V, 40W lamps. Calculate the armature currents and generated emf. Allow 1V per brush as brush contact drop.

- 6.a) Explain and draw the characteristics of DC motors.
- b) A 400 V, 6 pole shunt motor has a two-circuit armature winding with 250 conductors. The armature resistance is  $0.3\Omega$ , field resistance is  $200\Omega$  and flux per pole is 0.04 Wb. Find the speed and electromagnetic torque developed if the motor draws 10A from the supply.
- 7.a) Explain the principle of operation, types and constructional features of transformer.
- b) A transformer has 4% resistance and 6% reactance drop. Find the voltage regulation at full load for:
- i) 0.8 pF lagging      ii) 0.6pF leading and      iii) UPF.
8. Write notes on any two of the following:
- a) Capacitor motors
- b) Shaded pole motor
- c) AC Servomotor.

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