Time: 3 Hours **Total Marks: 80**

N.B.

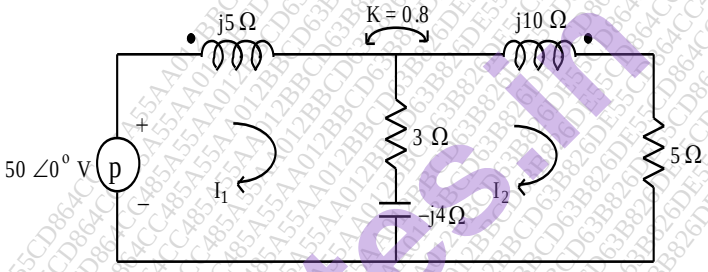
1) Question No. 1 is Compulsory

2) Out of remaining questions, attempt any three

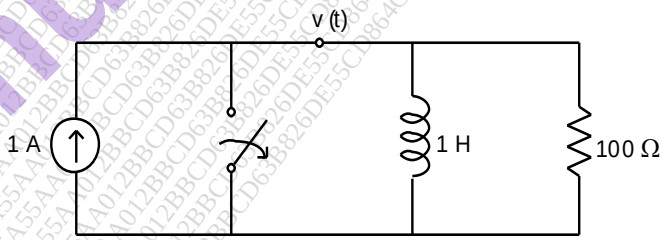
3) Assume suitable data if required

4) Figures to the right indicate full marks

1 (A) Draw equivalent circuit for given magnetically coupled circuit. **05**



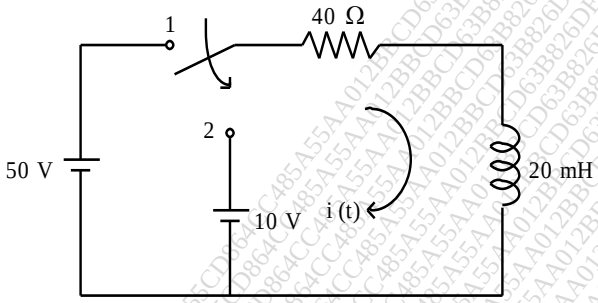
(B) In the network shown in Fig., at t = 0, switch is opened. Calculate v, $\frac{dv}{dt}$ at t = 0+. **05**



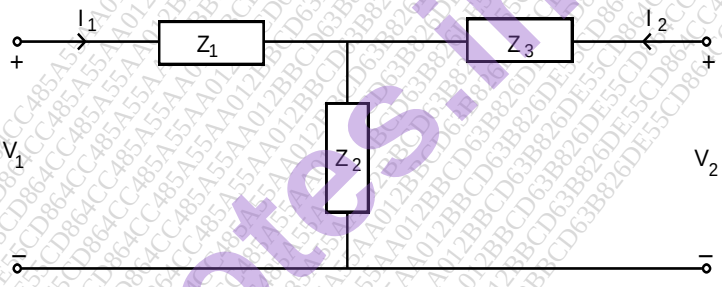
(C) The Z parameters of a 2 port network are, Z_{11} = 20 Ω, Z_{22} = 30 Ω, $Z_{12} = Z_{21}$ = 10 Ω. Find Y parameters. **05**

(D) Two two port networks are connected in parallel. Prove that the sum of the corresponding individual parameters is equal to the overall y parameters. **05**

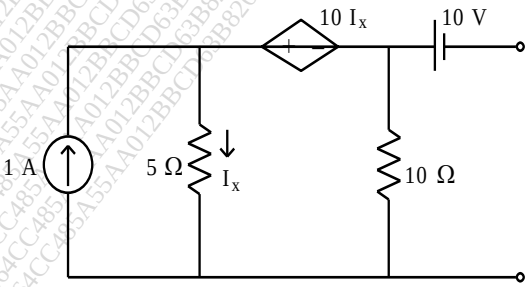
2 (A) The network of Fig. is under steady state with switch at position 1. At t = 0, switch is moved to position 2. Find i (t). **10**



(B) The Z-parameters of a two port are : $Z_{11} = 20\ \Omega$, $Z_{12} = Z_{21} = 10\ \Omega$, $Z_{22} = 30\ \Omega$. Find equivalent T-network. **10**



3 (A) Determine Thevenin's equivalent network for the Fig. shown. **10**



(B) The parameters of a transmission lines are R = 65Ω/km, L=1.6mH/km, G = 2.25 mmho/km, C=0.1μF/km. Find **10**

i) Characteristic Impedance

ii) Propagation Constant

iii) Attenuation Constant

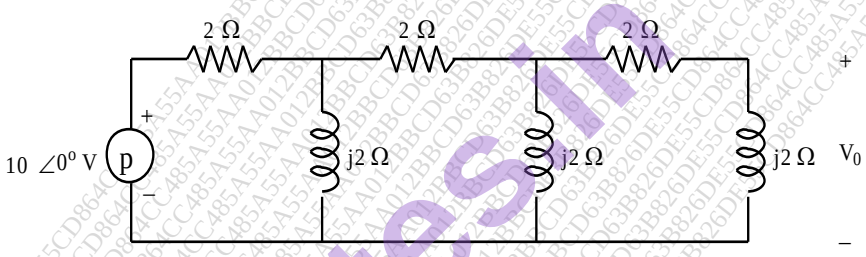
iv) Phase Constant at 1 kHz

4 (A) Determine whether following functions are positive real **10**

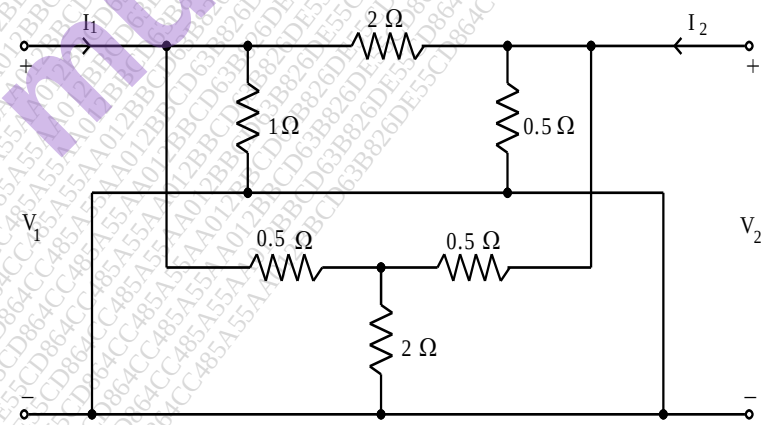
i) $\dfrac{s^4 + 2s^3 + 3s^2 + 1}{s^4 + s^3 + 3s^2 + 2s + 1}$

ii) $\dfrac{s^2 + 2s}{s^2 + 1}$

(B) In the network of Fig. find V_0. **10**



5 (A) Find Y-parameters for the network shown in Fig **10**

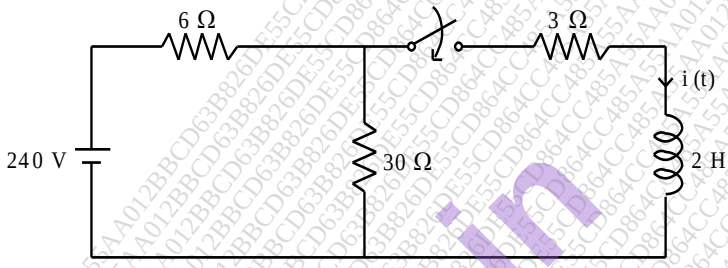


(B) Realize the following functions in Foster I and Foster II form **10**

$$F(s) = \frac{4(s+1)(s+3)}{(s+2)(s+6)}$$

6 (A) A transmission line has a characteristics impedance of 50 ohm and terminate in a load Z_L= 25 + j50 ohm. Use smith chart and Find VSWR and Reflection coefficient at the load. **10**

(B) The switch in Fig. is open for a long time and closes at t = 0. Determine i (t) for t > 0. **10**



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