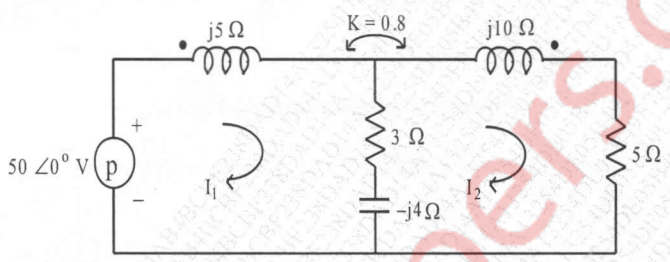
Q. P. Code: 24590

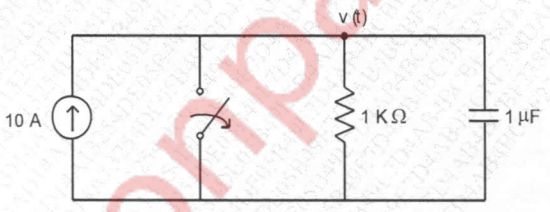
Time: 3 hours Total Marks: 80

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



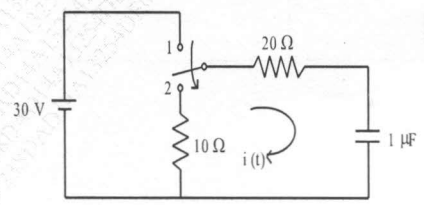
(B) In the given network of Fig., switch is opened at t = 0. Solve for v and $\frac{dv}{dt}$ at t = 0+. 05



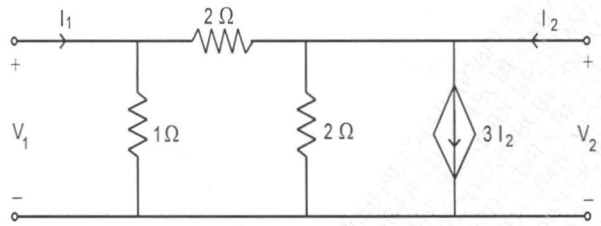
(C) Prove that AD – BC = 1 for Transmission parameters. 05

(D) Define the folowing parameter of transmission lines: 05
i) Input impedance
ii) Charateritics Impedance
iii) VSWR
iv) Reflection Coefficient
v) Transmission Coefficient

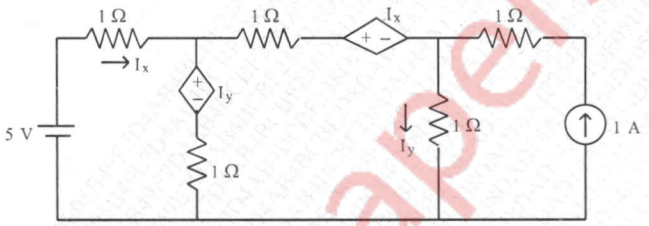
2 (A) In the network shown in Fig., switch is changed from position 1 to position 2 at t = 0, steady condition having reached before switching. Find the values of i, $\frac{di}{dt}$ and $\frac{d2i}{dt2}$ at t = 0+. 10



(B) For the network shown in Fig., find Z and Y-parameters. 10



3 (A) Find currents in the three meshes of network shown in Fig. 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

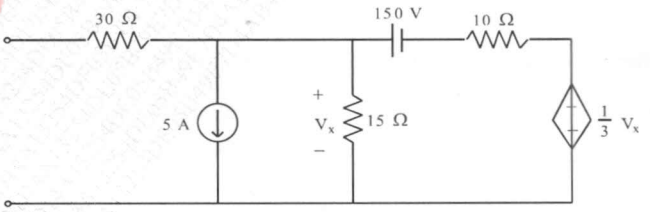
i) Characteristic Impedance
ii) Propagation Constant
iii) Attenuation Constant
iv) Phase Constant at 1 kHz

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

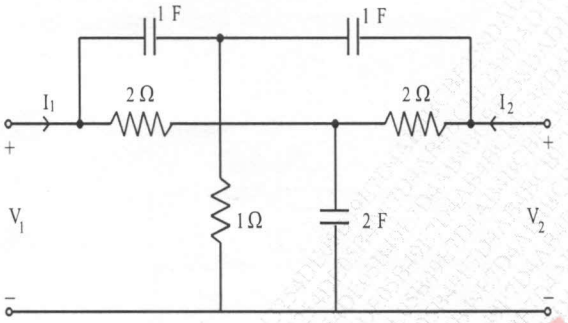
i) $\dfrac{s^4 + 3s^3 + s^2 + s + 2}{s^3 + s^2 + s + 1}$

ii) $\dfrac{s\,(s+3)\,(s+5)}{(s+1)\,(s+4)}$

(B) Obtain Thevenin equivalent network of Fig. 10



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

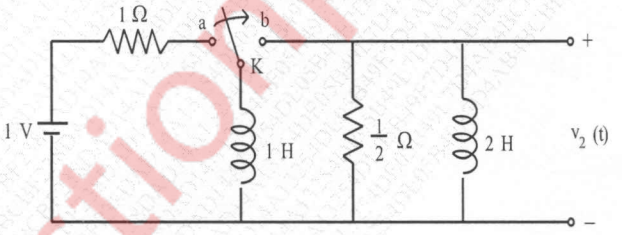


(B) Realize the following functions in Foster II and Cauer I form 10

$$Z(s) = \frac{2(s^2+1)(s^2+9)}{s(s^2+4)}$$

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) In the network of Fig. switch is in position 'a' for a long time. At t = 0 switch is moved from a to b. Find $v_2(t)$. Assume that the initial current in 2 H inductor is zero. 10



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