Duration – 3 Hours **Total Marks - 80**

N.B.: - (1) Question No.**1** is compulsory.
(2) **Attempt** any **Three** questions out of the remaining **five** questions.
(3) Assume suitable data if necessary and justify the same.

Q 1. Answer **all questions**.

A) Define with suitable example i) Tree and Co-tree ii) Graph and Oriented graph. **05**

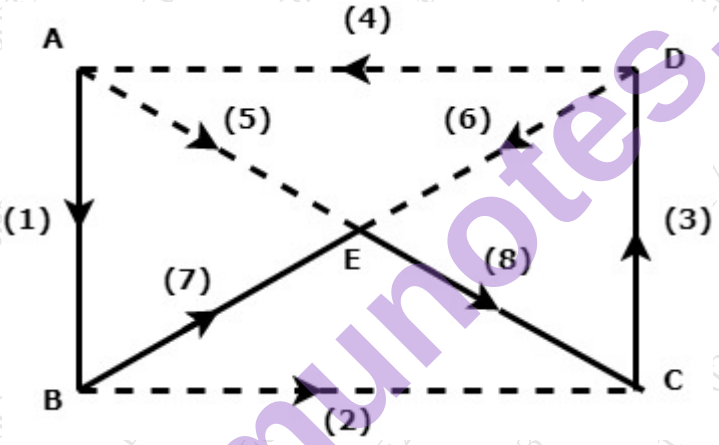
B) Find poles and zeroes of following function and plot pole zero diagram. (05) **05**

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

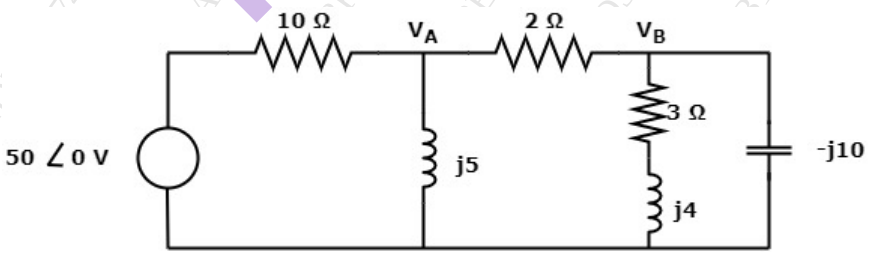
C) State and explain maximum power transfer theorem **05**

D) Obtain Y parameters in terms of Z parameters.

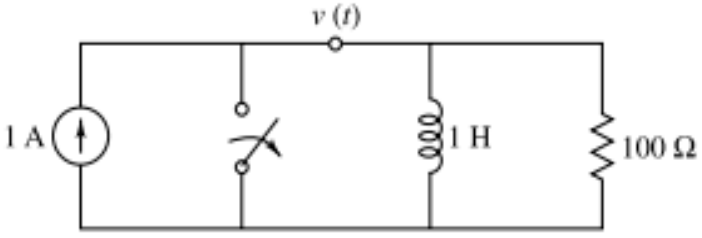
Q2a) For the graph shown below, write f-tieset and f-cutset matrix.



Q2b) Determine V_A and V_B in the network shown below. **05**

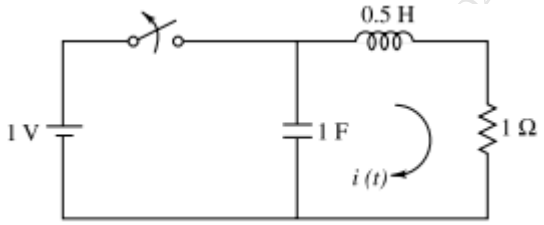


Q 3a) **10**



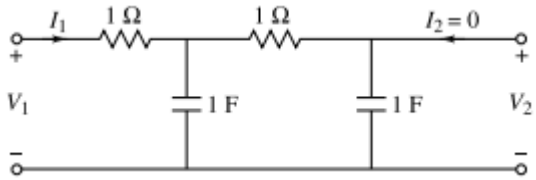
Find $v, \frac{dv}{dt}, \frac{d^2v}{dt^2}$ when switch is opened at t=0

Q3 b)



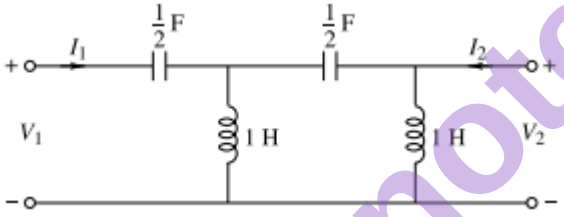
Switch is opened at t=0, steady state condition is reached before t=0. Find i(t) using laplace transform.

Q4 a) For the network shown in, determine transfer function v_2/v_1



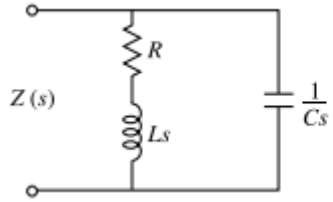
Q4 b) Obtain h parameters in terms of ABCD parameters

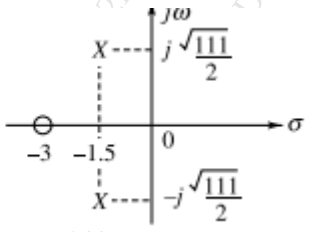
Q5 a) Determine Y-parameters for the network shown



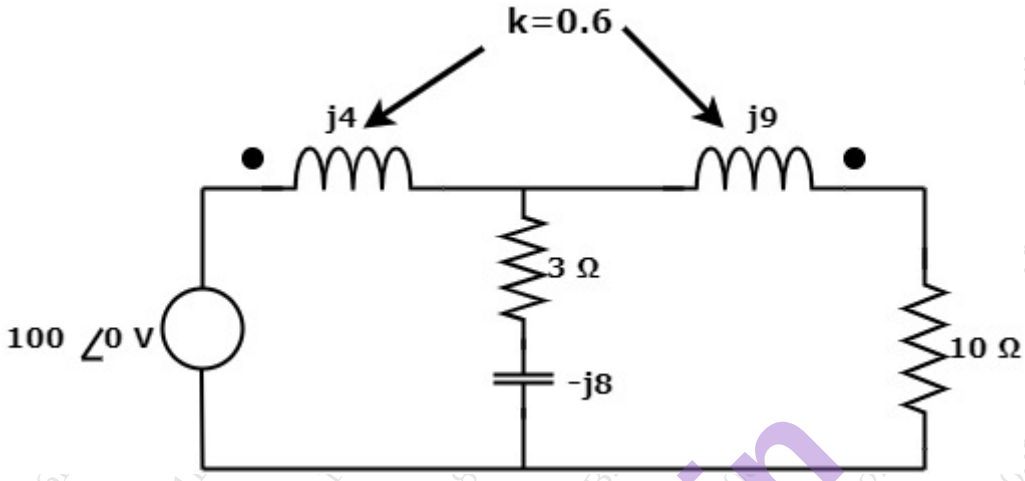
Q5 b) Write down restrictions on Pole and Zero Locations for Driving-Point Functions and Transfer Functions.

Q 6a) A network and its pole-zero configuration are shown in Fig. 10.53. Determine the values of R, L and C if Z (j0) = 1. **10**





Q 6b) Calculate mesh currents in the circuit shown below. **10**



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