

Seat  
No.

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मध - 012

## Networks and Lines (1100)

P. Pages : 3

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Assume suitable data if necessary.
6. Use of non-programmable calculator is allowed.
7. Black figures to the right indicate full marks.

### UNIT - I

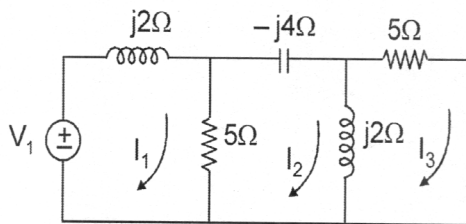
1. Attempt **any two** of the following.

a) State and prove Norton's theorem.

10

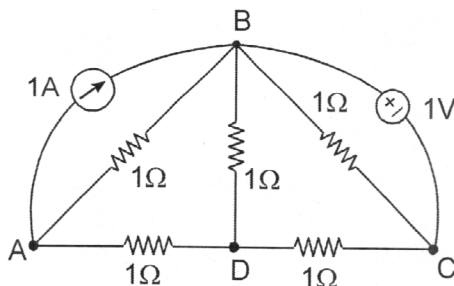
b) For the network show in the fig. obtain the current ratio  $I_1/I_3$ .

10



c) For the network given below draw the directed graph. Also draw possible No. of trees, write triset matrix.

10

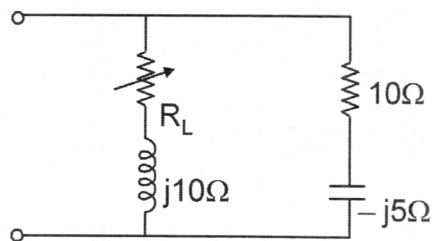


## UNIT - II

2. Attempt **any two** of the following.

- a) Determine expression of resonant frequency and bandwidth of a series resonant circuit. 10

- b) Determine the value of  $R_L$  in the following circuit so that the network becomes parallel resonant circuit. 10

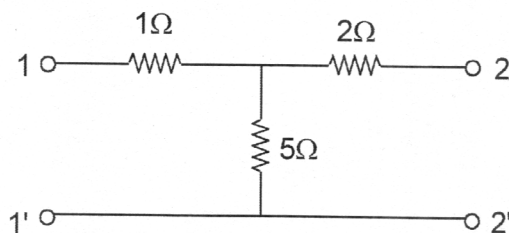


- c) A given generator of 1V, 1.5 MHz has an internal impedance of  $(500+j500)\Omega$ . Design L section network to couple this to  $8000\Omega$  resistance the impedance matching. 10

## UNIT - III

3. Attempt **any two** of the following.

- a) Find image and iterative impedances of T network shown in the following fig. 10



- b) Calculate the characteristic impedance, the attenuation constant and phase constant of a symmetrical T network if -

$$Z_{OC} = 55^\circ \angle -60^\circ \Omega$$

$$Z_{SC} = 50^\circ \angle -14^\circ \Omega$$

- c) Explain various types of transmission lines and also explain the important parameters of transmission lines. 10

## UNIT - IV

4. Attempt **any two** of the following.
- a) Give in detail the classification of filters & write a note on composite filter and its significance. 10
  - b) Obtain the design equations for T and  $\pi$  symmetrical networks attenuators. 10
  - c) Design T type attenuating network to match between  $400\Omega$  and  $800\Omega$  to give attenuation of 15 dB. 10

## UNIT - V

5. Attempt **any two** of the following.
- a) Explain the transient response specifications with diagram. 10
  - b) What do you mean by initial conditions in the networks ? Why to study initial conditions ? 10
  - c) A resistor of  $10k\Omega$  and a capacitor of  $50\mu F$  are connected in series across 100V DC supply. Find the current at  
i)  $t = 0$       ii)  $t = \infty$       iii)  $t = RC$  10

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