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S.E. (Electrical Engineering) (II Sem.) EXAMINATION, 2019

# NETWORK ANALYSIS

(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

N.B. :—

(i) Answer Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4,

Q. No. 5 or Q. No. 6, Q. No. 7 or Q. No. 8.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Figures to the right indicate full marks.

(iv) Use of calculator is allowed.

(v) Assume suitable data, if necessary.

1. (a) Use the simplification technique, find  $V_x$  as shown in Fig. 1. [7]

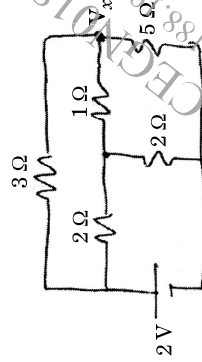


Fig. 1

P.T.O.

(b) Draw Dotted diagram and find total reactance as shown in

Fig. 2.

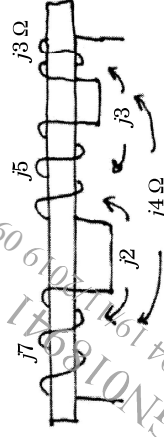


Fig. 2

Or

2. (a) Find current through  $5\Omega$  resistance by using Norton's theorem as shown in Fig. 3. [7]

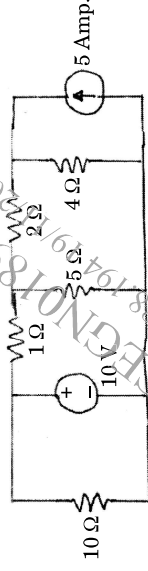


Fig. 3

(b) Develop the Tie Set B matrix, consider 1, 4, 5 Branches are forming Tree : [6]

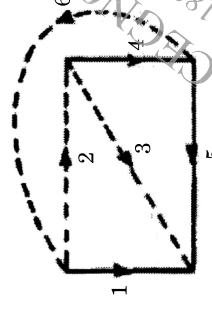


Fig. 4

2

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3. (a) For the circuit shown in Fig. 5, if switch S is opened at  $t = 0$ , solve for  $V$ ,  $dV/dt$ . [7]

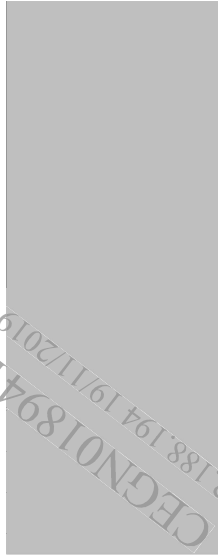


Fig. 5

- (b) Obtain  $F(S)$  for the wave shown in Fig. 6. [6]



Fig. 6

Or

4. (a) The switch is changed from point  $a$  to  $b$  at  $t = 0$ , determine voltage across  $1\text{ ohm}$  resistance at  $t = 3\text{ sec}$  using Classical Theory. [7]



Fig. 7

- (b) After being on position 1 for long time, the switch is thrown on position 2 at time  $t = 0$ , find current using Laplace Transform technique. [6]

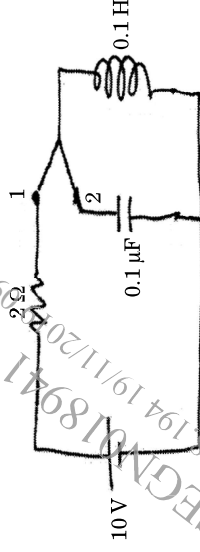


Fig. 8

5. (a) Find Z parameter for the circuit as shown in Fig. 9. [6]

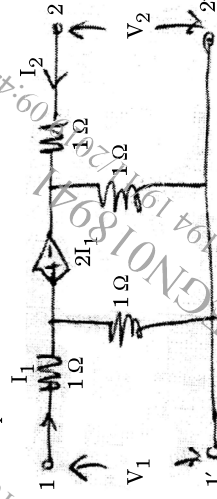


Fig. 9

- (b) Develop the relationship between Z parameter and Y parameter. [6]

Or

6. (a) Find Transfer Function of network as shown in Fig. 10. [6]

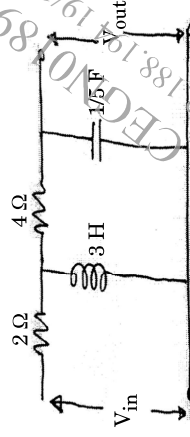


Fig. 10

- (b) Obtain Z parameter of network as shown in Fig. 11. [6]

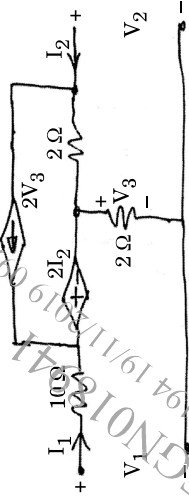


Fig. 11

7. (a) Design the low pass filter and develop relation of inductance and capacitance in terms of cut-off frequency and design resistance. [6]
- (b) A low pass filter is composed of symmetrical  $\pi$  section. Each series arm and shunt arm is 0.02 Henry and 2 microfarad. Find cut-off frequency and design resistance. [6]

Or

8. (a) Design the High pass filter and develop relation of inductance and capacitance in terms of cut-off frequency and design resistance. [6]
- (b) A HPF section is constructed from two capacitors 1 microfarad each and 15 millihenry find cut-off frequency and design resistance. [6]