

**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2007**

Electronics and Communication Engineering

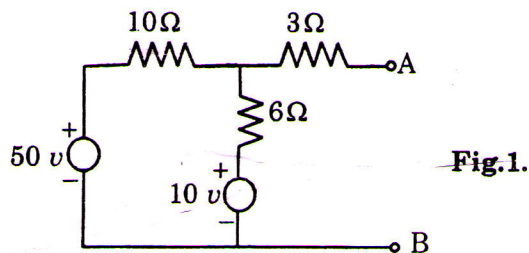
EC 2K 302—ELECTRIC CIRCUITS AND NETWORK THEORY

Time : Three Hours

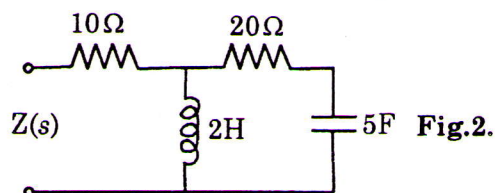
Maximum : 100 Marks

Answer all questions.

- I. (a) Derive the Thevenin's equivalent for the following circuit in Fig. 1.



- (b) Find the impulse response of simple RC network.
(c) What is the transformed equivalent of R and L ? Explain.
(d) Determine transform impedance $z(s)$ for the following circuit in Fig. 2.

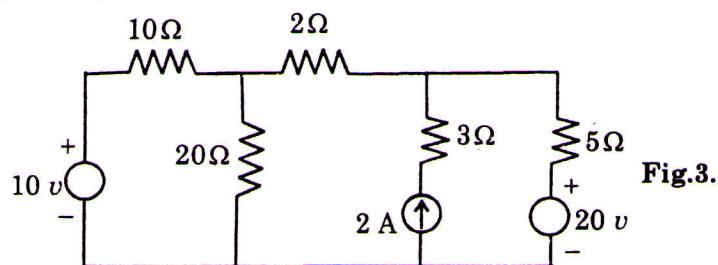


- (e) Explain about reciprocity theorem.
(f) Find the characteristic impedance of symmetrical T-network.
(g) What are the properties of positive real function ?
(h) Explain Strum's theorem.

(8 × 5 = 40 marks)

Answer (a) or (b) of Questions (II to V).

- II. (a) In the following Fig. 3, find the voltage across the 2Ω resistor by using super position theorem.



(15 marks)

Or

Turn over

- (b) Find the current in each branch and the total current in the following Fig. 4. and also find voltage across each element.

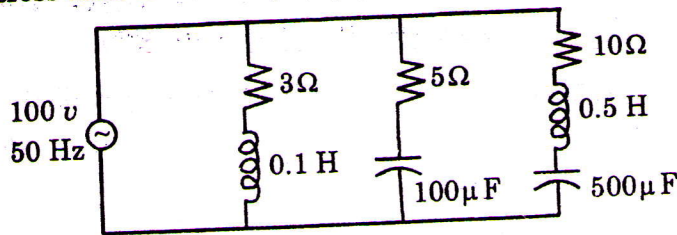


Fig. 4.

(15 marks)

(5 marks)

- III. (a) Determine the convolution integral of $f_1(t) = e^{-xt}$ and $f_2(t) = 2t$.
Using Laplace transform, find the current $i(t)$ in the following Fig. 5.

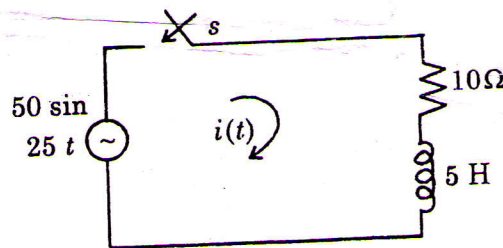


Fig. 5.

(10 marks)

Or

- (b) Determine the transfer function $G_{21}(s)$ and $Z_{21}(s)$ and the driving point impedance $Z_{11}(s)$ in the following Fig. 6.

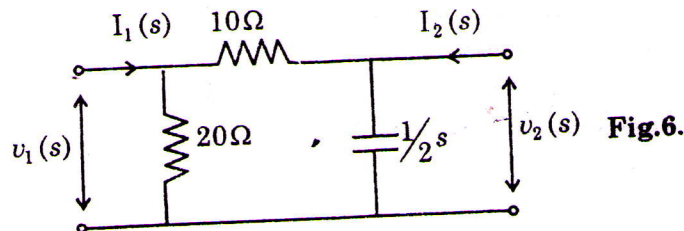


Fig. 6.

(8 marks)

Explain how the time domain response can be obtained from Pole-zero plot.

(7 marks)

- IV. (a) Find the values of Z and Y parameters in terms of h-parameters.
Determine the z and y parameters of the following network shown in Fig. 7.

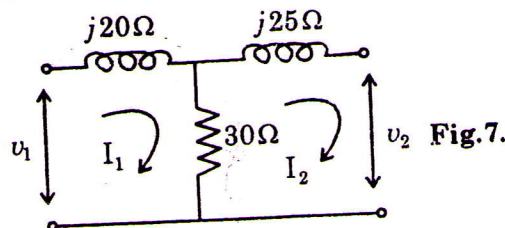


Fig. 7.

(7 marks)

Or