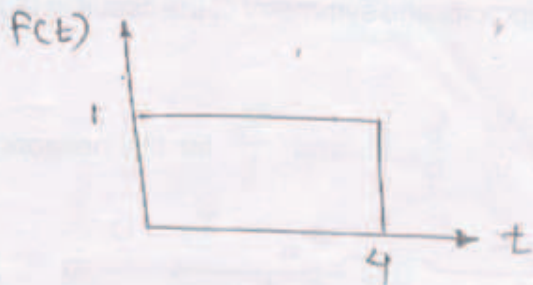


- N.B. :** (1) Question No. 1 is compulsory.
 (2) Solve any four questions out of remaining six questions.
 (3) Figures to the right indicate full marks.

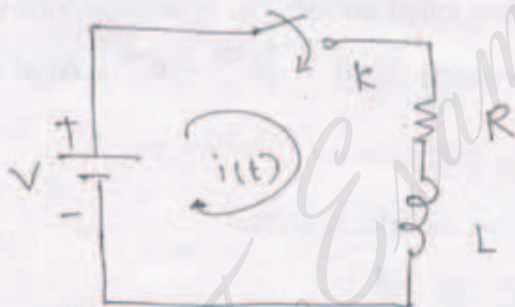
MASTER

1. (a) Find the Laplace transform of non-periodic function shown in figures - 21/270 ✓

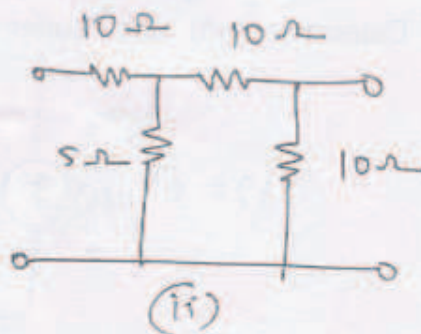
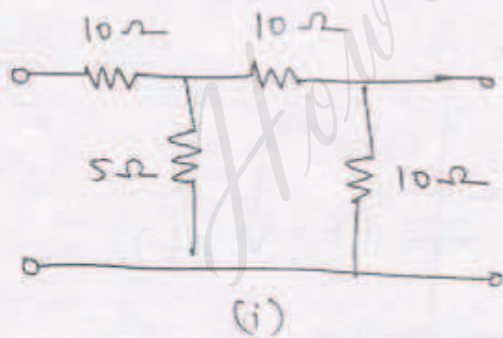
20



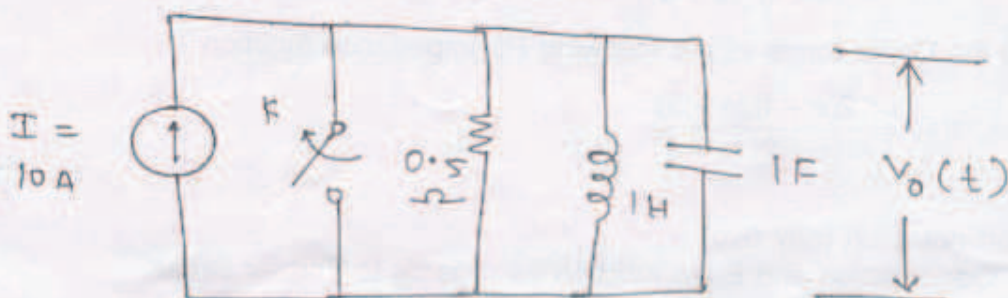
- (b) Find the z-parameters in terms of h-parameters.
 (c) Test whether the following function is Hurwitz Polynomial.
 (d) Using Laplace transform find the expression for $i(t)$ in the network given if switch is closed at $t = 0$.



2. (a) Two networks are shown in diagram. Obtain the transmission parameters of the resulting 10 circuit when both the circuits are cascade.



- (b) In the circuit shown in figure below, switch K is opened at $t = 0$. Find the expression 10 for the o/p voltage $V_o(t)$. Use Laplace transform.



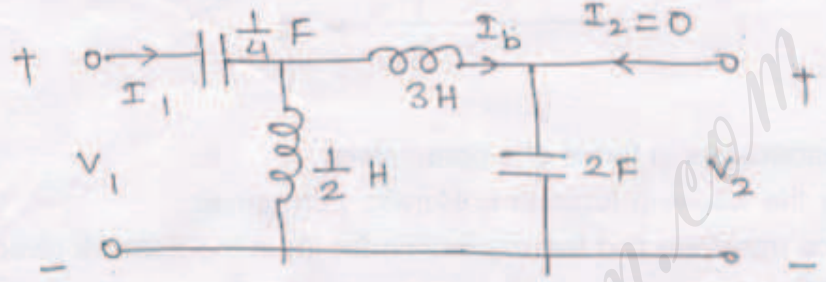
3. (a) Check whether the following functions are positive real -

(i) $F(s) = \frac{s + 3}{s^2 + 5s + 6}$

(ii) $F(s) = \frac{2s^3 + 2s^2 + 3s + 2}{s^2 + 1}$

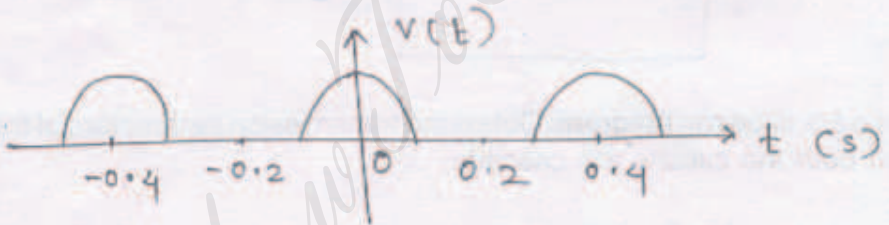
(b) Derive the conditions for reciprocity and symmetry of the circuit in terms of z-parameters. 10

4. (a) Find the network functions $\frac{V_2}{V_1}$, $\frac{I_2}{I_1}$, $\frac{V_1}{I_1}$ and $\frac{V_2}{I_1}$ for the network shown in figure. 10

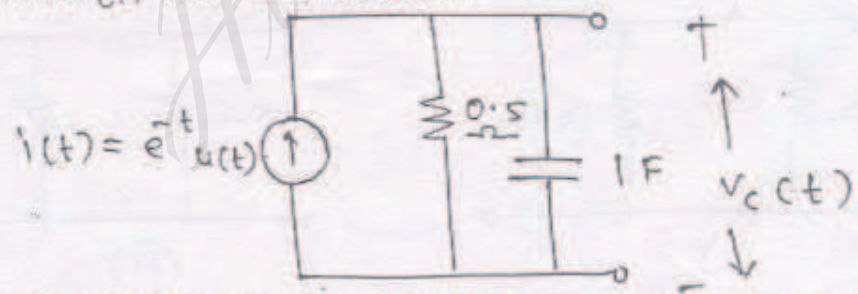


(b) The network shown has zero initial conditions. A voltage $V_1(t) = \delta(t)$ applied to two terminal network produces voltage $V_2(t) = [e^{-2t} + e^{-3t}]$. What should be $V_1(t)$ to give $V_2(t) = t e^{-2t}$. 10

5. (a) Find the Fourier series of the waveform shown - 10



(b) Determine $V_C(t)$ use Fourier transform - 10



6. (a) Realise the Foster forms of the following RC impedance function - 10

$z(s) = \frac{2(s + 2)(s + 4)}{(s + 1)(s + 3)}$

(b) Find the Caver forms of the following RL impedance function - 10

$z(s) = \frac{2(s + 1)(s + 3)}{(s + 2)(s + 6)}$

7. Write short notes on (any two) :- 20

- (a) Odd function and Even function as regards to Fourier series.
- (b) The complex TreQUENCY plane
- (c) Initial and final value theorems for Laplace transform