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No.

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मधुर - 042

Network Analysis & Synthesis (1050)

P. Pages : 4

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

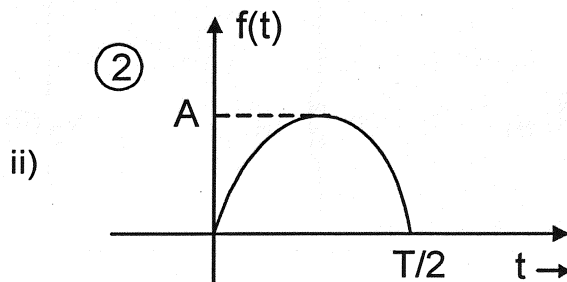
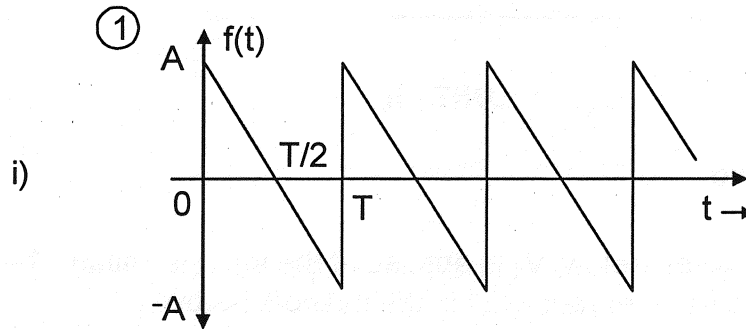
1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory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

UNIT - I

1. Attempt any two.

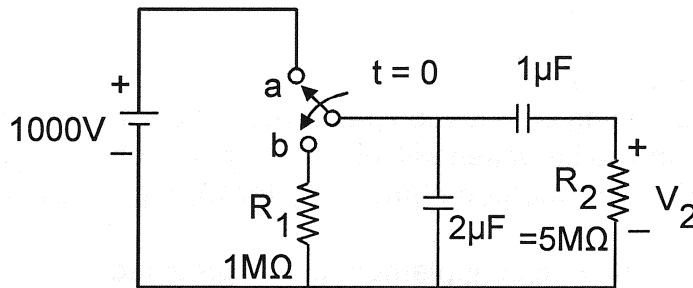
a) Find laplace transform of following waveforms.

10



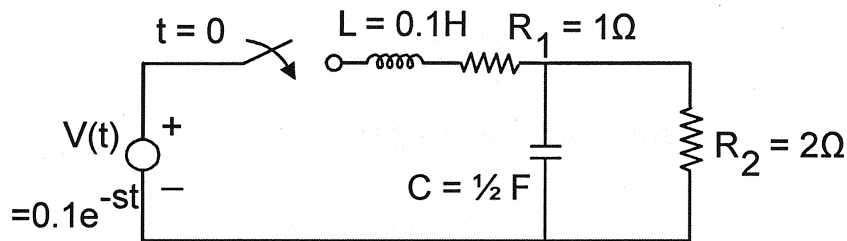
- b) With switch k in position 'a', the network reaches steady state. At time $t = 0$, the switch is moved to position 'b'. Find the voltage across R_2 by using laplace transformation for $t > 0$

10



- c) The switch is closed at $t = 0$ in the network shown below. Find the current $i_2(t)$ in the network by using Norton's theorem. Assume zero initial conditions.

10

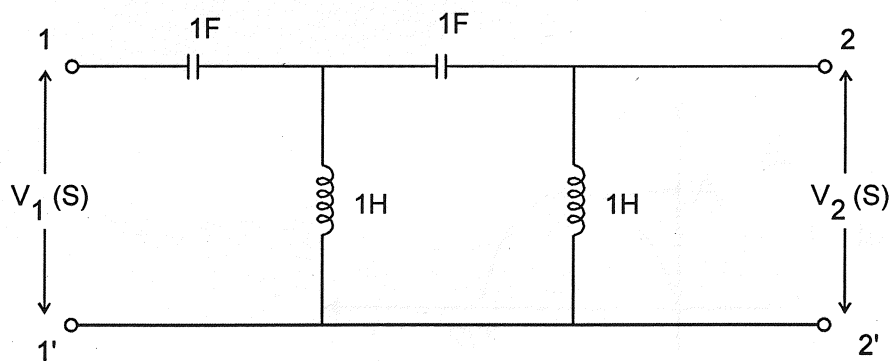


UNIT - II

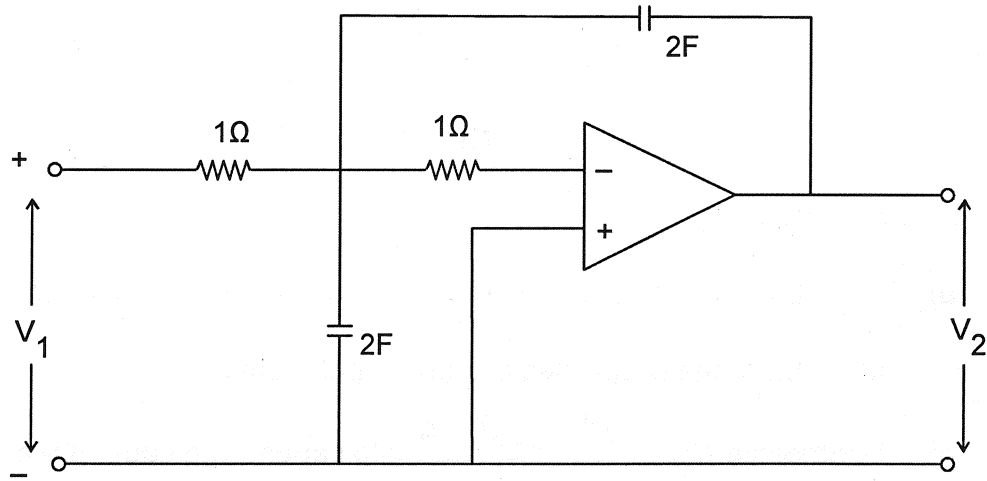
2. Attempt any two.

- a) In the fig., given below, V_1 is applied at the input terminals 1–1' find the voltage transfer ratio G_{21} in the network below.

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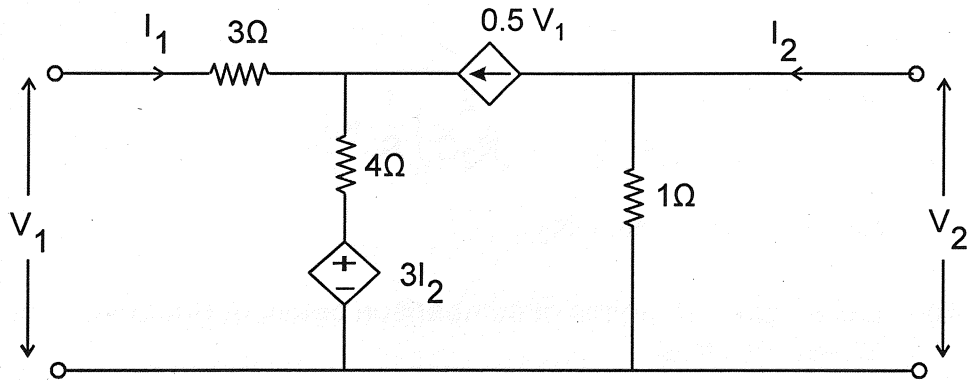
- b) i) Explain the concept and significance of poles and zeros.
 ii) State the necessary conditions for driving point function and transfer function. 10
- c) Find $\frac{V_2(s)}{V_1(s)}$ for the network shown below. 10



UNIT - III

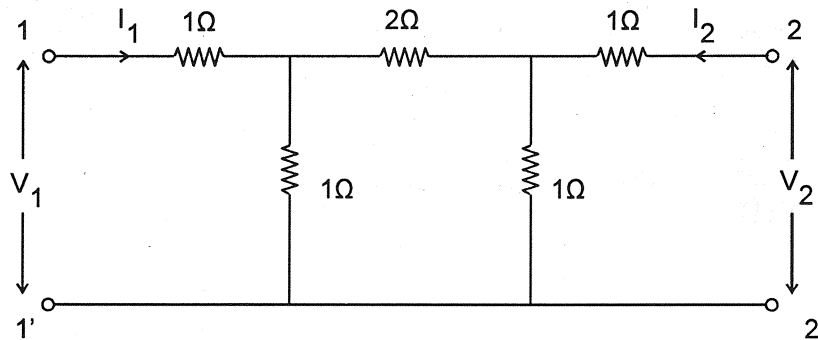
3. Attempt any two.

- a) Find the reciprocity and symmetry condition in terms of y-parameters. 10
- b) Determine h-parameters for the network shown below. 10



- c) For the network shown below find out ABCD parameters.

10



UNIT - IV

4. Attempt any two.

- a) i) State the necessary conditions for positive real function. 5
- ii) State the properties of Hurwitz polynomial. 5
- b) Synthesize $F(s) = \frac{s^4 + 10s^2 + 9}{s^3 + 4s}$ into cauer-I and cauer II form. 10
- c) Test whether $F(s) = \frac{s^4 + 2.5s^2 + 1}{s^5 + 4.5s^3 + 4.5s}$ is positive real function. 10

UNIT - V

5. Attempt any two.

- a) Show that transfer function of a second order HPF is given by

$$\frac{V_o}{V_s} = \frac{1}{\left(\frac{1}{R_1 R_2 C^2}\right) \frac{1}{s^2} + \left(\frac{2}{R_2 C}\right) \frac{1}{s} + 1}$$

Also find out R_1 and R_2 .

10

- b) List at least ten points of comparison between Butterworth and Chebyshev filter. 10
- c) Explain frequency normalization and impedance normalization. 10
