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3E1402

Roll No. : _____ Total Printed Pages : 4

3E1402

B. Tech. (Sem. III) (Reback) Examination, February - 2013
Applied Electronics & Inst. Engg.
3AI3 Circuit Analysis and Synthesis
(Common for Old Scheme back of 3IC3, 3AI3 and 3BM6.1)

Time . 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. Nil 2. Nil

UNIT - I

1 (a) State Thevenin's theorems with proof. 8

(b) Determine the current through the 5 Ω resistor in the circuit shown in fig.

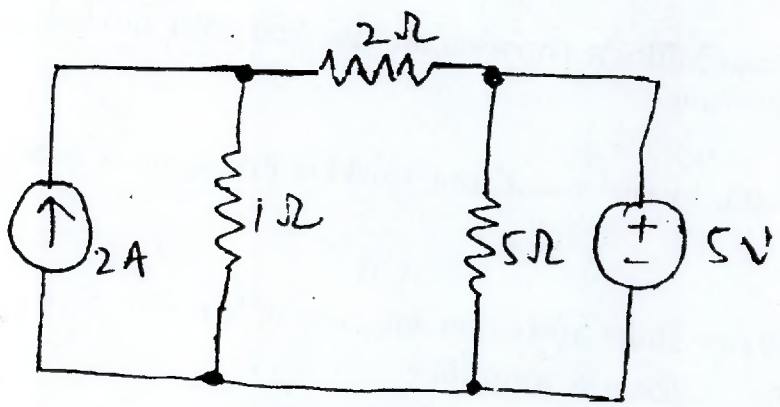

Fig. 1 8

OR

2 (a) State and explain the maximum power transfer theorem. 8

(b) Find the value of I in the following dia. using superposition theorem :

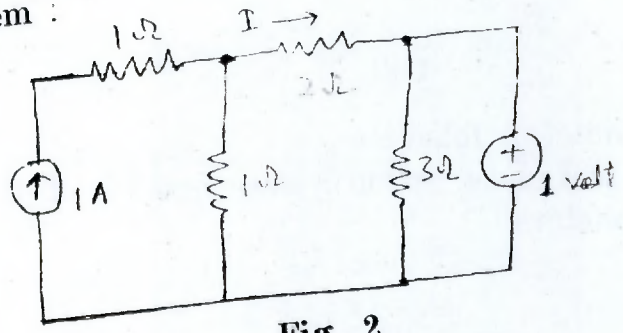

Fig. 2 8

UNIT - II

3 (a) Explain with suitable example the concept of driving point impedance transfer functions. 8

(b) Check the stability of the following system expressed by the polynomials :

$$P(s) = s^3 + 2s^2 + 2s + 40$$ 8

OR

4 (a) Explain RL and RC networks synthesis. 8

(b) The driving point impedance of an LC network is

$$Z(s) = \frac{10\left(s^2+4\right)\left(s^2+16\right)}{s\left(s^2+9\right)}$$

Obtain the first form of foster network. 8

UNIT - III

5 (a) Find the z-parameters for the following network that is a π-type attenuator section.

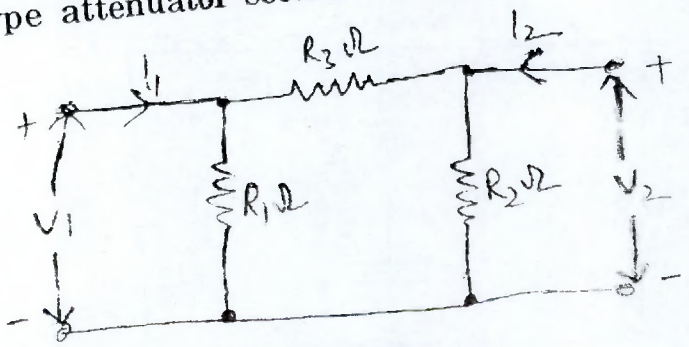

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Fig. 3

[Contd...

(b) Obtain the ABCD parameters in terms of y-parameters and h-parameters.

8

OR

6 Write technical note on following :

(i) Attenuation and phase shift in symmetrical T and π networks.

(ii) Image parameters.

8×2=16

UNIT - IV

7 (a) Find the total inductance of the three series connected coupled coils shown in fig.

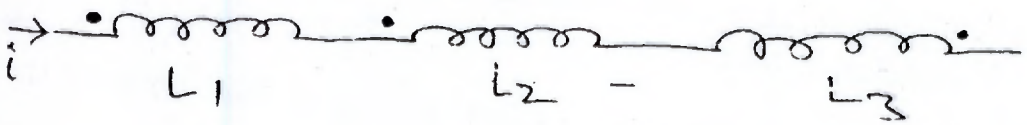

Fig. 3

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(b) In the coupled circuit of the given diagram find the input impedance as well as the net inductance.

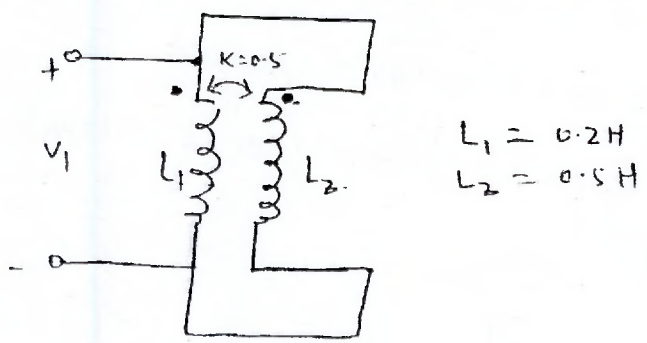

Fig. 4

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OR

8 (a) Find the conductively coupled equivalent circuit for the network shown in fig.

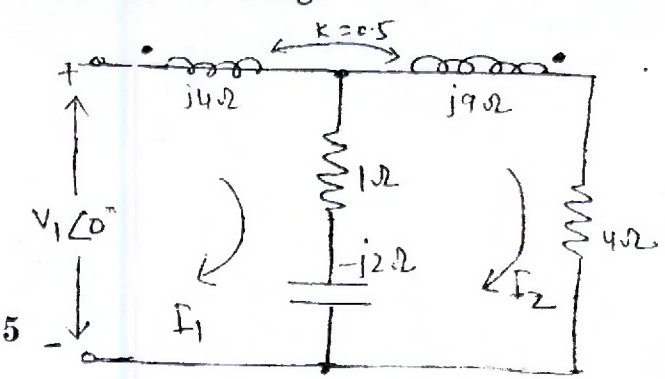

Fig. 5

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(b) Explain transformer equivalent inductively coupled circuits. 8

UNIT - V

9 (a) Obtain the Laplace transform of the following pulse.

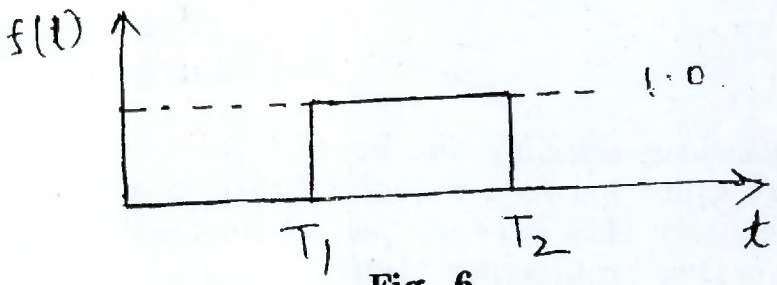

Fig. 6

(b) Explain the initial value and final value theorems.

(c) Give the unit step response analysis of first order circuit. 5+5+6

OR

10 (a) Find current in the RC circuit shown in the figure.

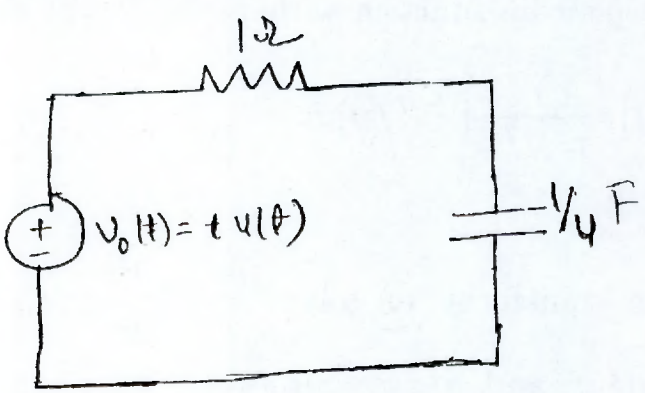

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Fig. 7

(b) Write technical note on :

(i) Properties of Fourier analysis

(ii) Power in a circuit. 8
