

AU – 2522

Third Semester B. E. (Elect. Engg. / Elec. and Power) (CGS) Examination

NETWORK ANALYSIS

Paper – 3 EP 02/3 EX 02/3 EL 02/3 EE 02

(USC – 10478)

P. Pages : 6

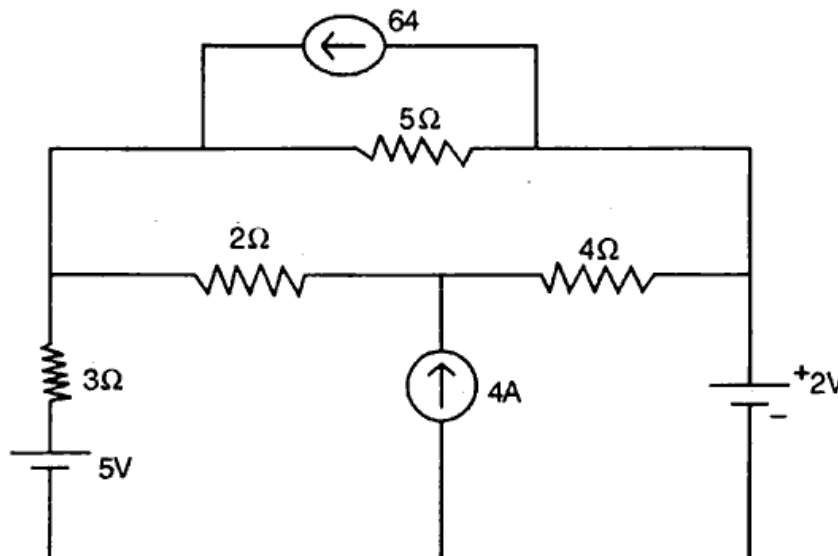
Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
- (2) Answer **Three** questions from Section A and **Three** questions from Section B.
- (3) Due credit will be given to neatness and adequate dimensions.
- (4) Assume suitable data wherever necessary.
- (5) Illustrate your answer wherever necessary with the help of neat sketches.
- (6) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION A

1. (a) Explain in detail :
- (i) Independent sources
- (ii) Dependent sources. 6
- (b) Using nodal analysis, find the current through the resistor in the circuit.

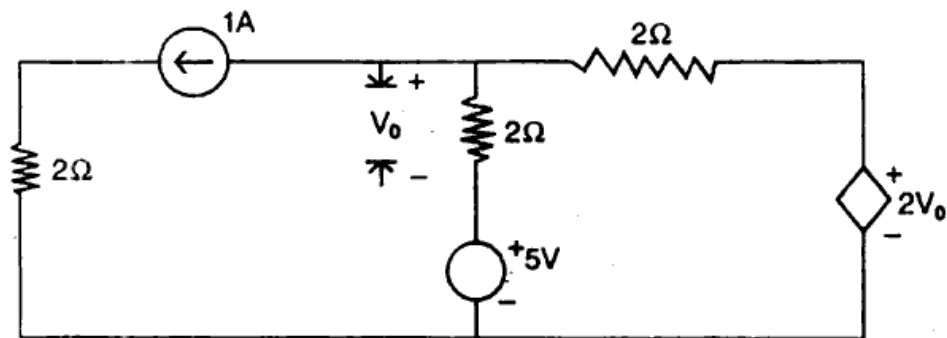


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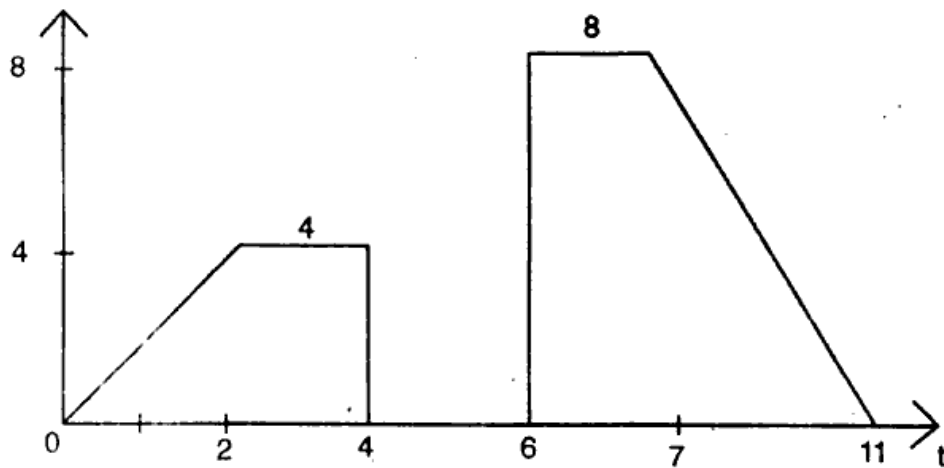
OR

2. (a) What is the power supplied by the dependent source shown in fig. below.



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- (b) Write an expression for the figure shown below,

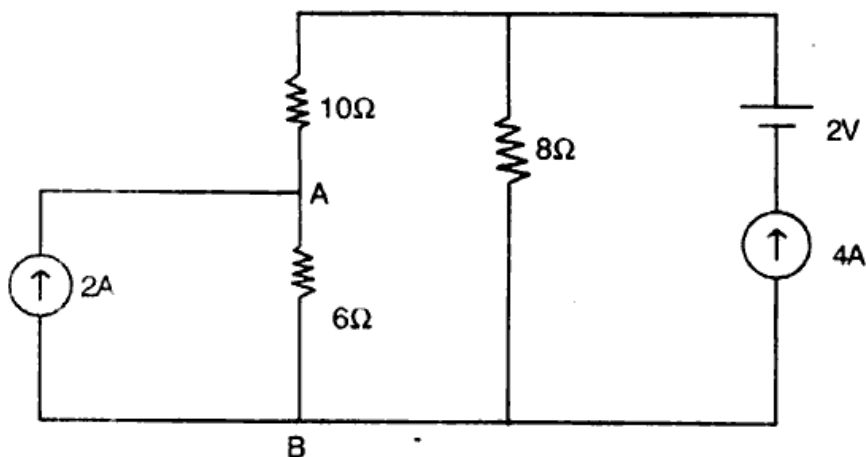


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3. (a) State and explain Millman's theorem.

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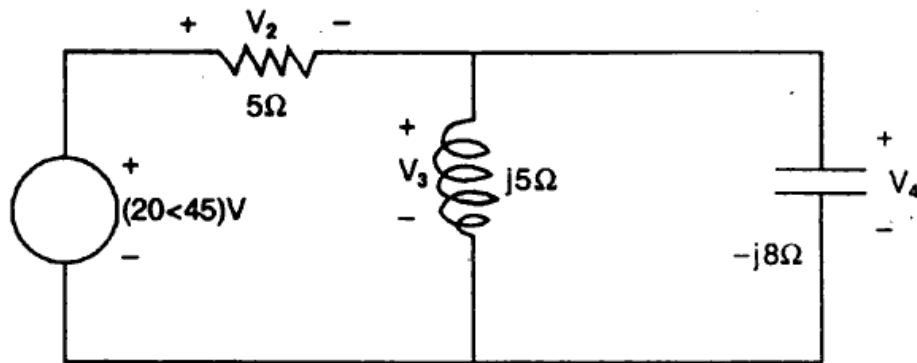
- (b) Find V_{AB} by superposition theorem for the network shown in figure below,



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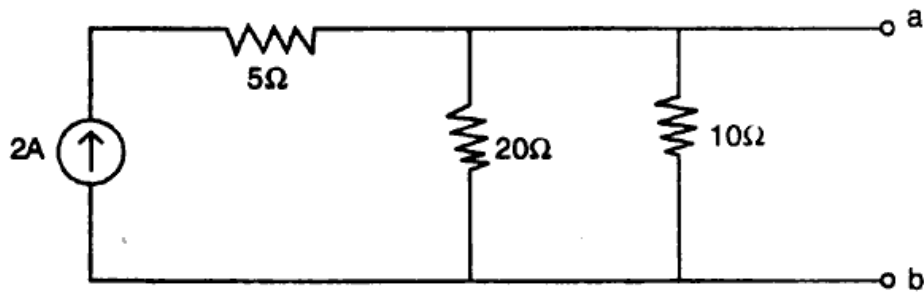
OR

4. (a) Verify Tellengen's theorem for the circuit shown in figure below,



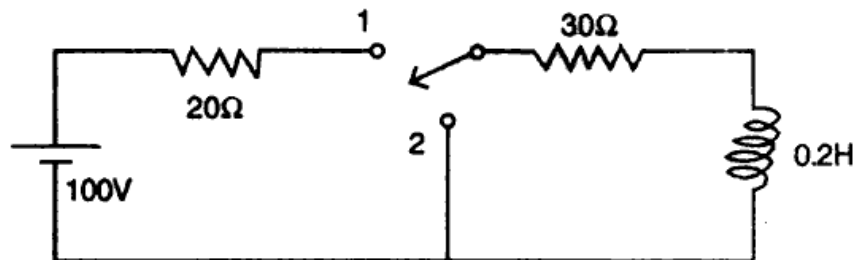
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- (b) Find the voltage across the terminals a-b and verify reciprocity theorem for the circuit.



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5. (a) For the circuit shown below, find the current equations at which switch is changed from position '1' to '2'.



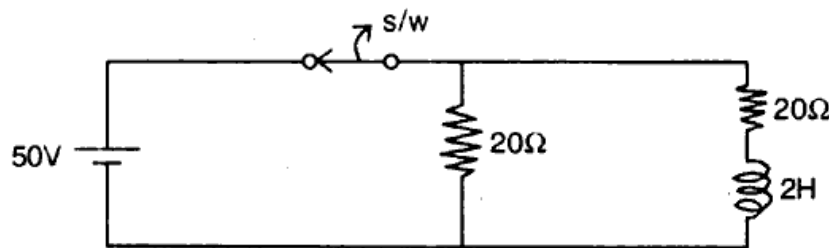
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- (b) Derive an expression for DC response of R-C circuit.

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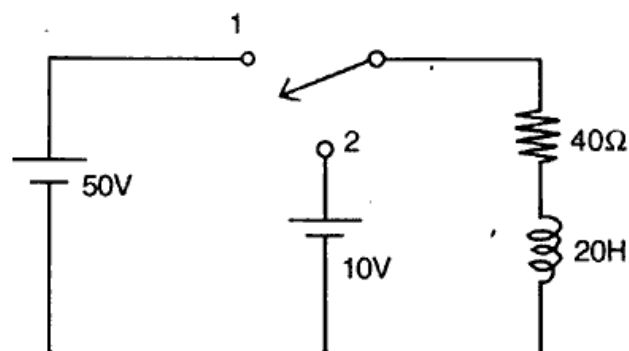
OR

6. (a) A $15 \mu\text{F}$ capacitor is connected in series with $1.1 \text{ M}\Omega$ resistor. This series combination is connected across a 120 V D. C. supply. Calculate,
- The time constant of the ckt.
 - The initial value of charging current.
 - The initial rate of rise of voltage across the capacitor.
 - The voltage across the capacitor after a time equal to the time constant.
- (b) For the circuit shown below, find the current equation when the switch is opened at $t = 0$.



SECTION B

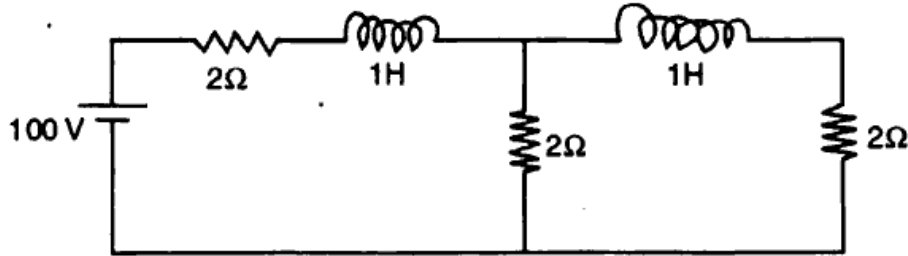
7. (a) Find the expression for $i(t)$ for the figure shown below, by Laplace transform



- (b) Verify final value theorem for the following function using Laplace transform
- $$F(t) = 2 + e^{-3t} \cos 2t.$$

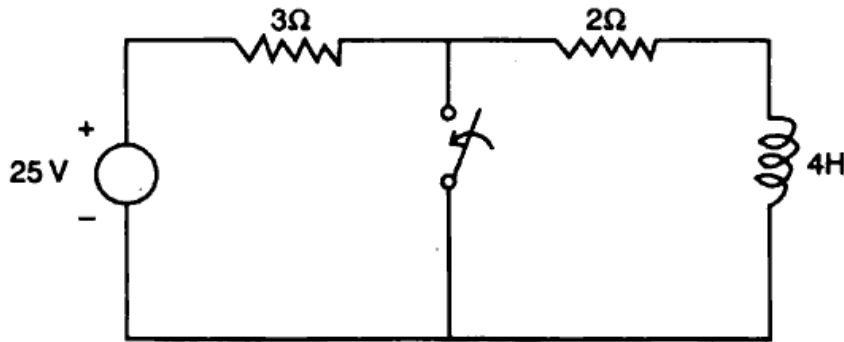
OR

8. (a) In the network shown in figure below, find $P_2(t)$.



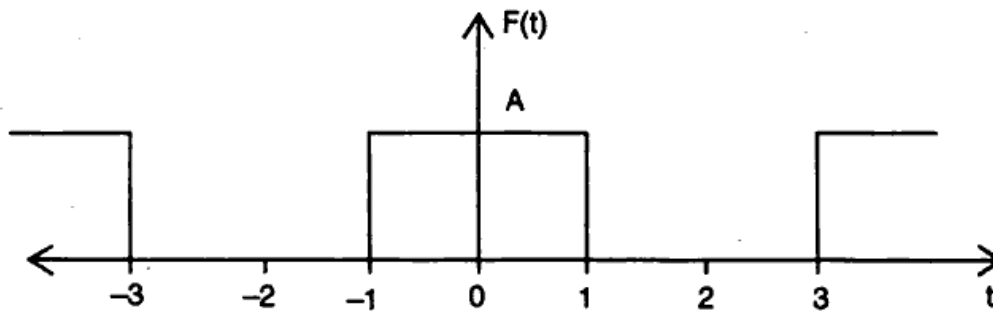
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- (b) Find the inductor current $i(t)$ for the circuit shown in figure where the switch was initially opened.



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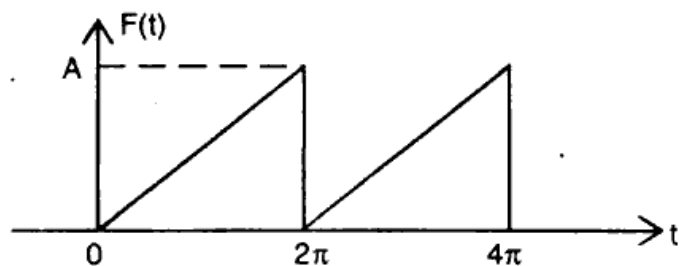
9. (a) Explain odd symmetry of Fourier series. 7
(b) Obtain Fourier series of the rectangular waveform shown in figure below,



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OR

10. (a) Find Fourier series of the following waveform

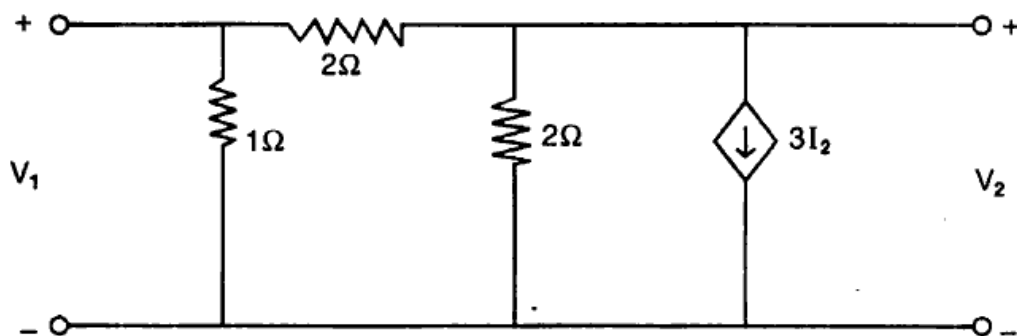


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- (b) Explain Odd symmetry of Fourier series.

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11. (a) Determine 'z' parameter for the fig. shown,



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- (b) Derive the condition for reciprocity and symmetry of a 2-port network for z-parameter.

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OR

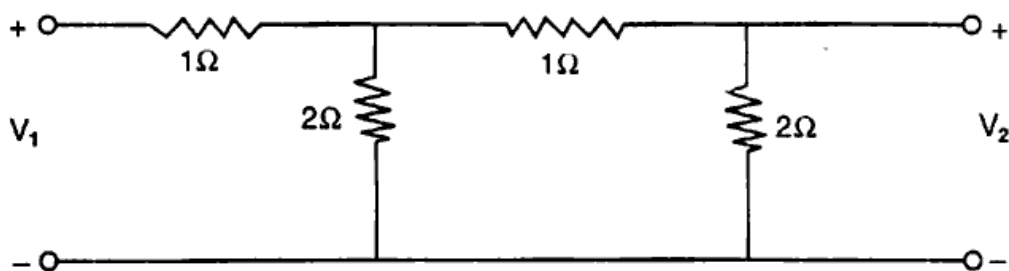
12. (a) Derive an expression for z-parameter's interval of

(i) V-parameters and

(ii) T-parameters

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- (b) Find z-parameter for the networks,



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