

Code: EE2T5

I B.Tech - II Semester – Regular Examinations – April 2016

ELECTRICAL CIRCUIT ANALYSIS - I
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours

Max. Marks: 70

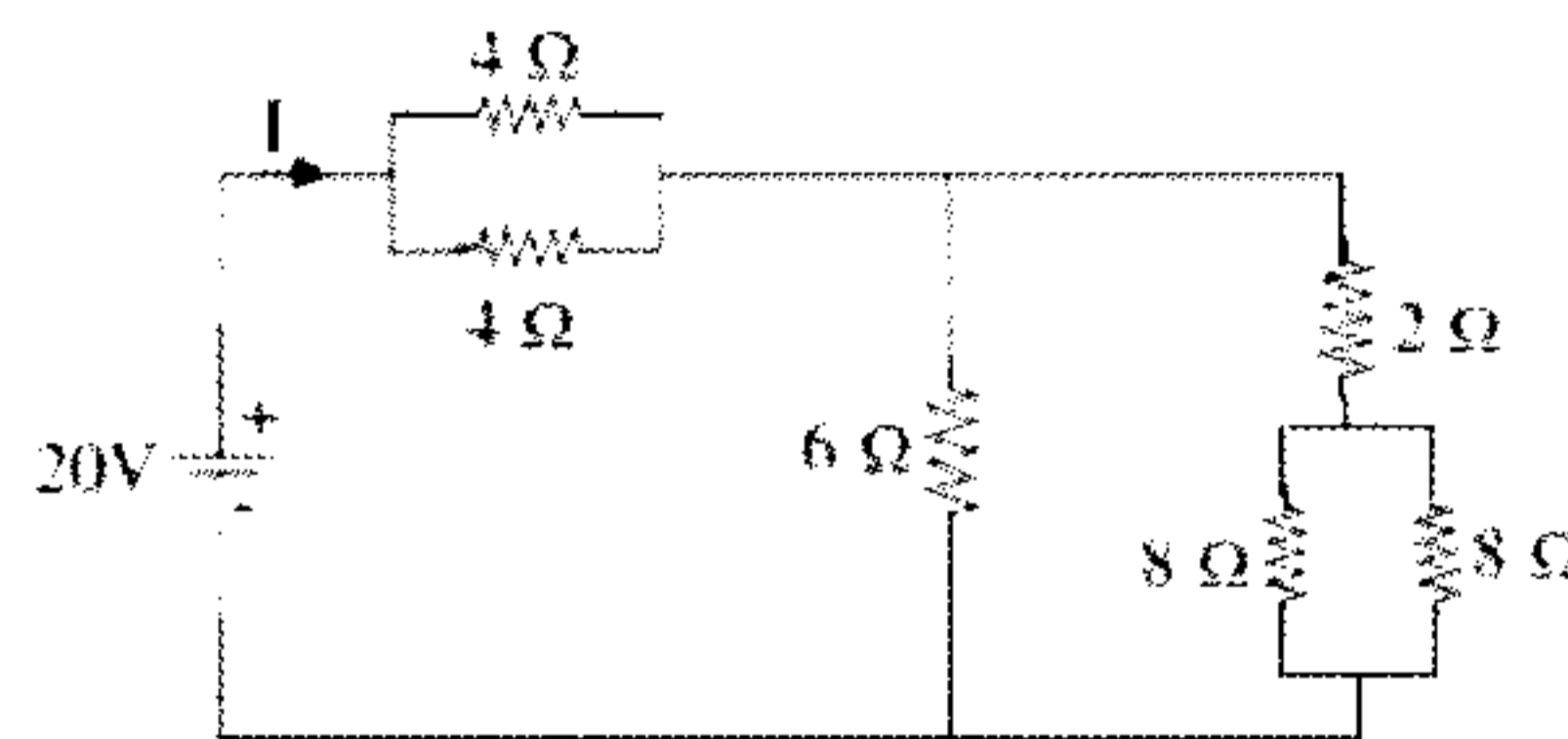
PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) Define Active and passive elements with suitable examples.
- b) Define: i) Graph ii) Tree
- c) Find the total current I of the circuit shown in below figure.



- d) Explain the source transformation technique with an example.
- e) Explain about different types of dependent sources.
- f) Define quality factor. What is its significance?
- g) Draw the impedance triangle of series R-L and R-C circuits.

- h) Three identical impedances of $(9+j12)$ are connected in star. Find an equivalent delta connected network.
- i) What are the advantages of a poly phase system over a single phase system?
- j) What is duality? What are dual quantities?
- k) Two wattmeters are used to measure power in a 3-phase three wire load. Determine the power factor, if the wattmeter readings are $W1 = 1000W$ and $W2 = -1000W$.

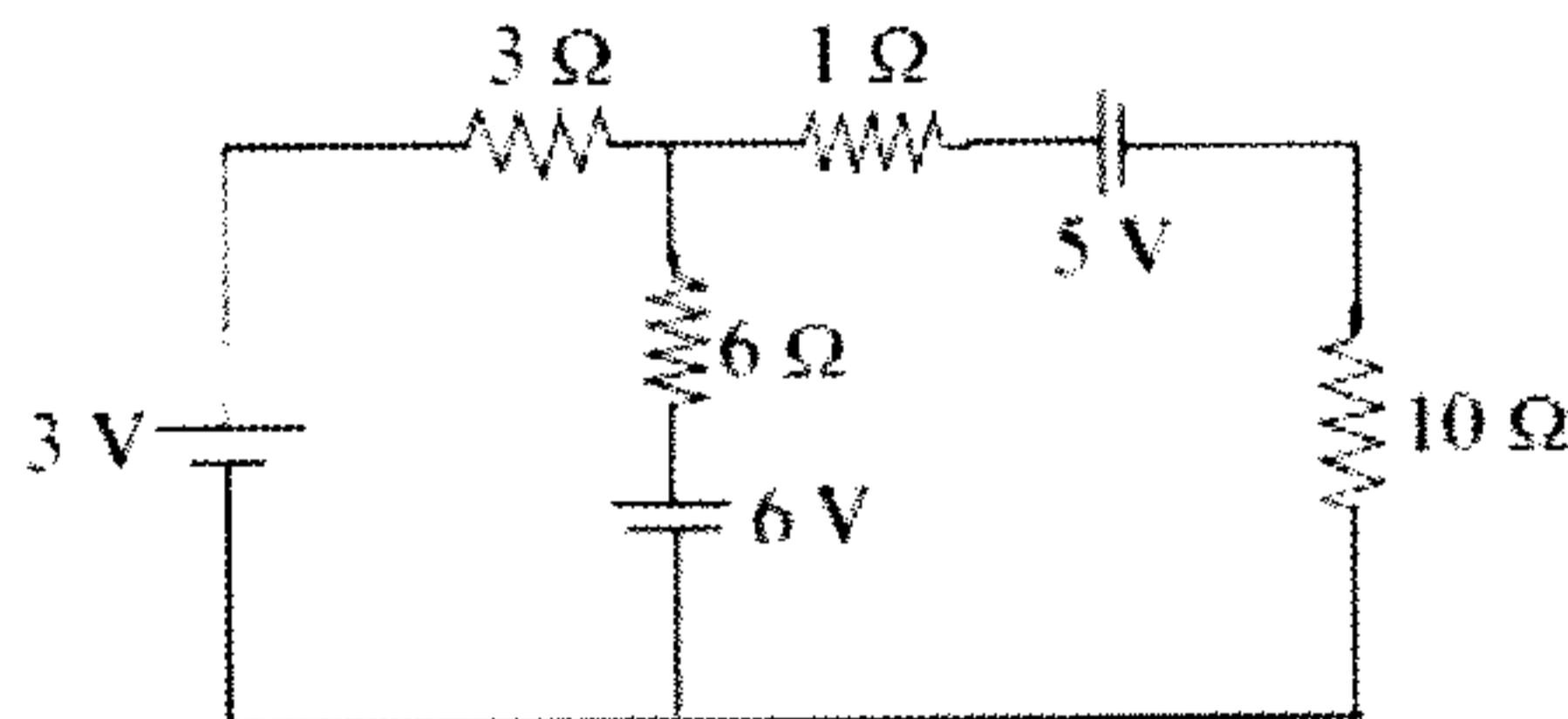
PART – B

Answer any **THREE** questions. All questions carry equal marks.

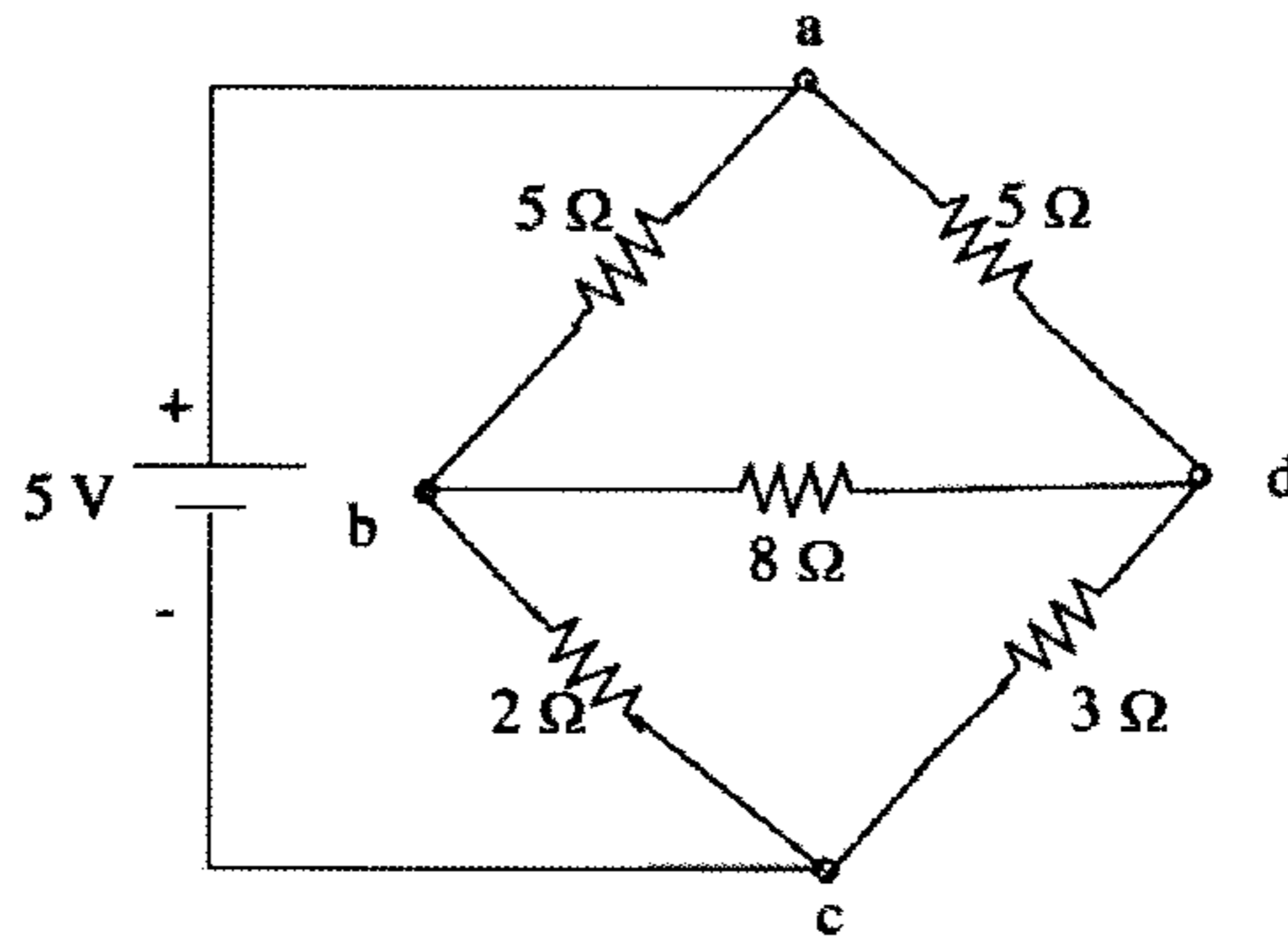
3 x 16 = 48 M

2.

- a) Using source transformation approach, find the voltage across the 10Ω resistor in the circuit of below shown Figure. 8 M



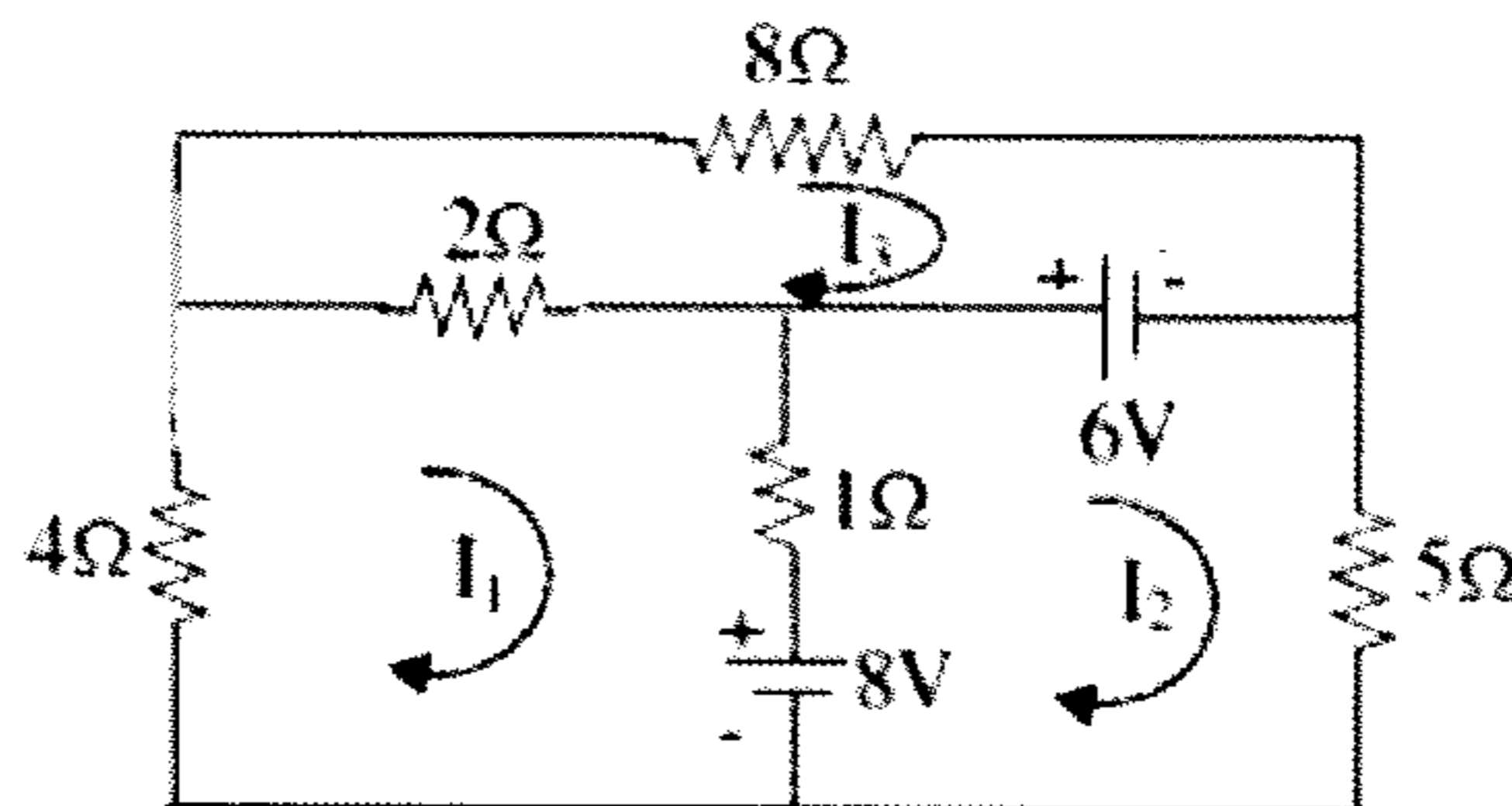
- b) Find the source currents in the resistive network (shown in below figure) by using delta to star / star to delta transformations. 8 M



3.

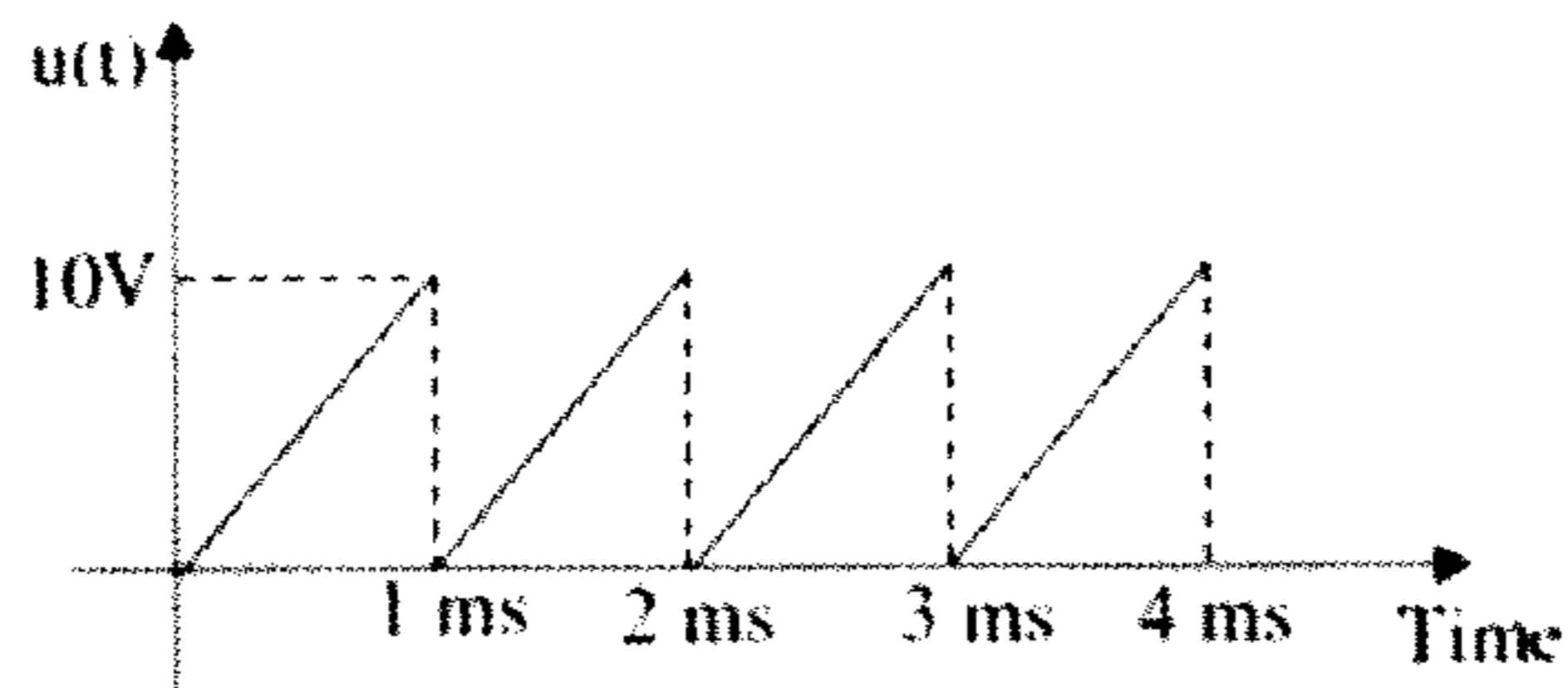
a) Explain the procedural steps for Super Nodal Analysis. 6 M

b) Using mesh analysis, find the loop currents for the circuit shown in below Figure. 10 M



4. Determine R.M.S value, Average value, Form Factor and Peak Factor for the waveform shown in below Figure .

16 M



5.

a) Derive the relationship between phase voltage and line voltage in a balanced 3Φ star connected system. 8 M

b) Three identical impedances of $(3+j4) \Omega$ are connected in delta form to a three phase, 400V, 50Hz supply. Find (i) phase currents (ii) line currents (iii) total power consumed. 8 M

6. A symmetrical 3-phase, 3-wire, 440V supply is connected to a star connected load. The impedances in each branch are : $Z_1 = (2+j3)$, $Z_2 = (1-j2)$, $Z_3 = (3+j4)$. Find phase voltages, phase currents, line currents and the total power consumed in the circuits using (i) loop method and (ii) application of millmans theorem method. 16 M