



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:II
Class:FY	Program:B.Tech
Branch Code:FYE	Pattern:2023
Name of Course:Electrical Networks	Course Code:2300118E
Max. Marks:60	Duration:2.30 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Marks CO**

**Question No. 1**

- 1a) Describe the conversion of a voltage source into a current source, and vice-versa. (6) CO1

**Question No. 2**

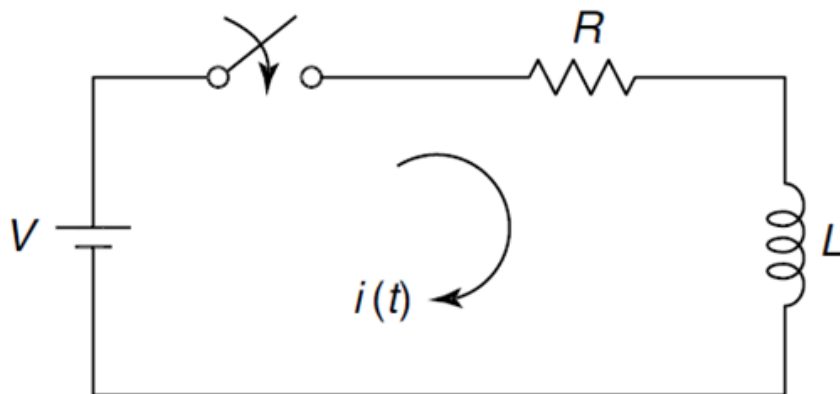
- 2a) Draw the phasor diagrams of an ideal resistor, ideal inductor and ideal capacitor. (6) CO2

**Question No. 3**

- 3a) What is "Laplace Transform"? What is the Laplace transform of  $e^{-at}$ ? (8) CO2

**OR**

- 3b) Using the Laplace transform, determine the current expression for the following LR circuit. Assume zero initial conditions and the switch is closed at  $t=0$ . (8) CO2



- 3c) The Laplace transform equation for a circuit is given as  $I(s) = \frac{a/b}{s(s+c/d)}$ . Determine the current equation in time-domain for the circuit. (8) CO2

**OR**

3d) What is the unit-step function? Determine the Laplace transform of the unit-step function. (8) CO2

**Question No. 4**

4a) Define the short-circuit admittance parameters. What is the relationship of currents I1 and I2 with voltages V1 and V2 in matrix form? (8) CO3

**OR**

4b) Determine the Y-parameters for the following circuit shown in Fig. 1 indirectly by using the z-parameters. (8) CO3

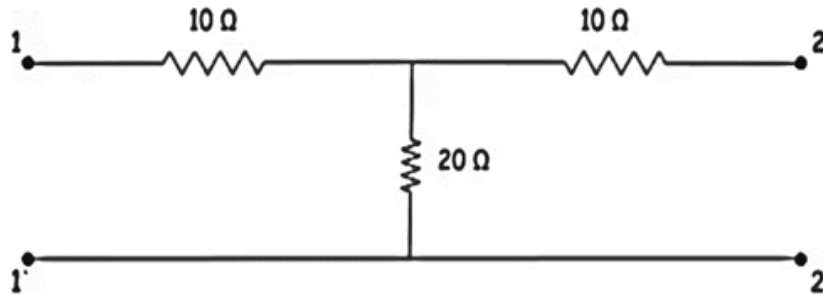


Fig.1

4c) What are h-parameters? What is the relationship of voltages V1 and V2 with the currents I1 and I2 in matrix form? (8) CO3

**OR**

4d) The Z-parameters of a circuit are given as (8) CO3

$$z = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

Find the Y-parameters of the circuit.

**Question No. 5**

5a) How can we convert a star-network to a delta network? Assume a suitable star-network and give all the equations for the converted delta network. (8) CO1

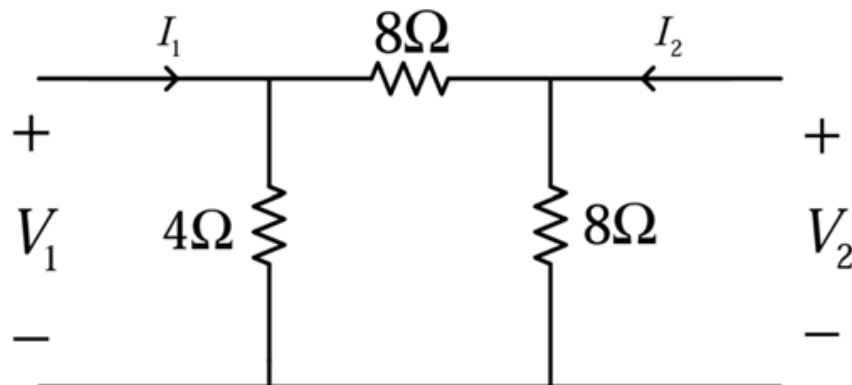
**OR**

5b) Consider a sinusoidal waveform  $v(t) = V_m \sin(\omega t + \phi)$  volts. Draw the waveform and determine its average and RMS values. (8) CO2

5c) What is impulse function and state properties of impulse function. (8) CO2

**OR**

5d) Determine the Z-parameters of the circuit shown in Fig. 2. (8) CO3



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