



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

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:II
Class:FY	Program:B.Tech
Branch Code:ETC	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 03 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.

**Question No. 1 Attempt following Question**

- 1 State and explain Norton's theorem. (6) CO1

**Question No. 2 Attempt following Question**

- 2 Draw and explain the phase relations between voltage and current using phasor plots for all three cases- resistive network, capacitive network and inductive network. (6) CO2

**Question No. 3 Attempt following Question**

- 3.a) Determine the inverse Laplace Transform of the function (10) CO2

$$I_2(s) = \frac{1000}{s(s^2 + 40s + 300)}$$

$$F(s) = \frac{6}{s} - \frac{1}{s-8} + \frac{4}{s-3}$$

**OR**

- 3.b) State and explain any five properties of Laplace Transform. (10) CO2

- 3.c) Represent ramp signal mathematically as well as graphically. (6) CO2

Determine the Laplace transform of ramp function  $f(t) = tu(t)$ .

**OR**

- 3.d) Discuss the concept of damping in RLC circuits. How does the damping affect the transient response? (6) CO2

**Question No. 4 Attempt following Question**

- 4.a) Find Y parameters for the network shown in Fig.1 (8) CO3

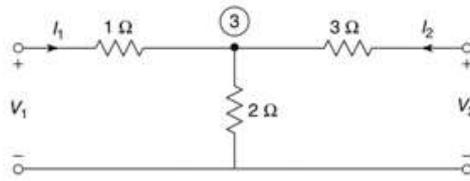


Fig.1

**OR**

- 4.b) Why hybrid parameters are called so? Give the names along with units for all four h parameters. (8) CO3

- 4.c) Find open circuit impedance parameters for the circuit shown in Fig. 2 (8) CO3

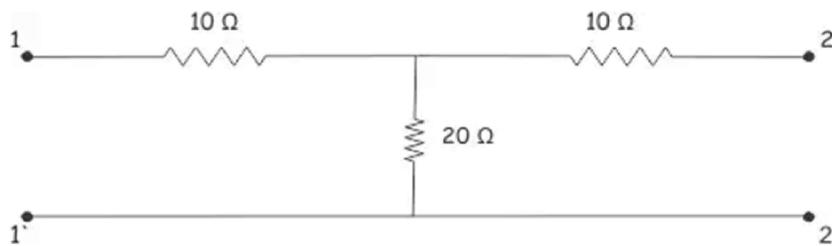


Fig. 2

**OR**

- 4.d) Derive the equations for transmission parameters of a two-port network. (8) CO3

**Question No. 5 Attempt following Question**

- 5.a) What is the difference between a lumped network and distributed network? (8) CO1, CO2  
Differentiate between active and reactive power.

**OR**

- 5.b) Convert a voltage source of 24V having a series internal resistance of 2 Ohm into an equivalent current source. (8) CO1, CO2  
For a series RLC circuit derive the formula for resonant frequency.

- 5.c) State any four properties of impulse function. (8) CO2, CO3  
Explain image impedance in a two port network.

**OR**

- 5.d) Explain characteristic impedance in a two port network. (8) CO2, CO3  
Find Laplace Transform of  $f(t) = e^{-at}$ .

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