



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:IV
Class:SY	Program:B.Tech
Branch Code:ELE	Pattern:2023
Name of Course:Electrical Network Analysis	Course Code:2306211
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.

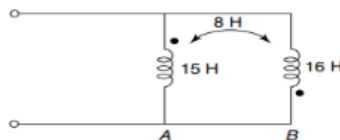
Marks CO

Question No. 1

- 1a) State and explain Maximum Power Transfer Theorem. (6) CO1, CO2

Question No. 2

- 2a) Obtain the dotted equivalent circuit for the coupled circuit of Fig. (6) CO1, CO2



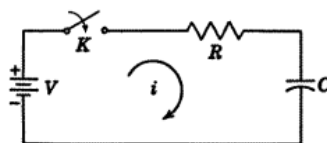
Question No. 3

- 3a) Obtain the expression for current through inductor in series RL circuit connected to a. d. c. voltage V for $t > 0$ using the Laplace transform. Assume initial current through inductor is zero (8) CO3

OR

- 3b) Explain the initial and final condition for resistor, inductor and capacitor in transient analysis. Give one example (8) CO3

- 3c) In the network shown in figure, the switch is closed at $t = 0$. With the capacitor uncharged, find value for of i , $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ at $t = 0+$, when $V = 100$ volts, $R = 1000$ ohms, and $C = 1 \mu\text{F}$. (8) CO3

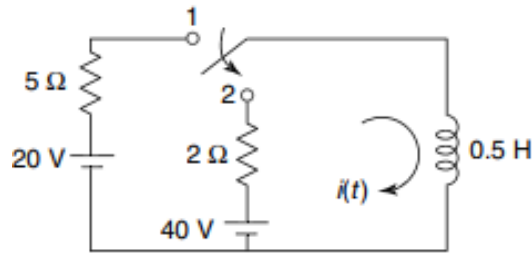


OR

- 3d) Define the time constants for RL and RC Circuits. Find the value of current in RL and voltage in RC circuit at $t=T$ and $T=4T$. (8) CO3

Question No. 4

- 4a) In the network of Fig. the switch is moved from 1 to 2 at $t = 0$. Determine $i(t)$, steady state being reached at position 1. (8) CO3



OR

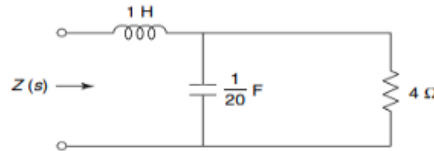
- 4b) Obtain the expression voltage across capacitor in series RC circuit connected to a. d. c. voltage V for $t > 0$ using the Laplace transform. Assume initial voltage across capacitor zero (8) CO2, CO3
- 4c) What is high pass filter? Draw its frequency response and derive the expression for the cut-off frequency. (8) CO5

OR

- 4d) Design a constant-k, T and Pi section low-pass filter is having 2.5 kHz cut-off frequency and nominal impedance of 700 Ohm. (8) CO5

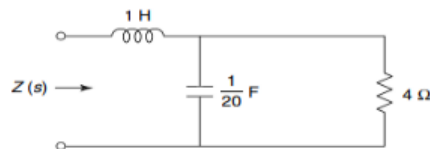
Question No. 5

- 5a) Determine $Z(s)$ in the network shown in figure Find poles and zeros of $Z(s)$ and plot them on s-plane. (8) CO4



OR

- 5b) What are short circuit parameters? Derive interrelation between Z and ABCD parameters. (8) CO4
- 5c) Determine $Z(s)$ in the network shown in figure Find poles and zeros of $Z(s)$ and plot them on s-plane. (8) CO4



OR

- 5d) What is driving point function and transfer function? Explain them for a two port network. (8) CO4

..... End of question paper.....