

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
B.Tech. I Year II Semester Regular / Supplementary Examinations, June 2025
BASIC ELECTRICAL ENGINEERING
(ECE)

Time: 3 hours

Max. Marks: 60

Answer ALL questions in PART-A.

Answer any ONE question from each unit in PART-B.

PART-A

5X2=10M

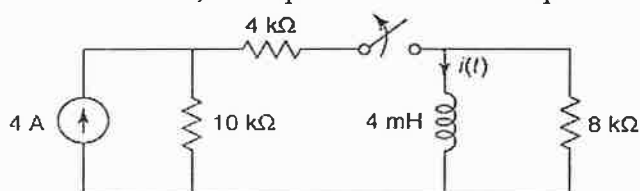
- | | | | | |
|----|---|----|------|------|
| a) | Explain the physical significance of the time constant in RL and RC circuits. | 2M | CO-1 | BL-2 |
| b) | Define ABCD parameters in a transmission network. | 2M | CO-2 | BL-1 |
| c) | Define pass band and stop band. | 2M | CO-2 | BL-1 |
| d) | Explain the purpose of the field winding in a DC generator. | 2M | CO-3 | BL-2 |
| e) | Distinguish core type and shell type transformer. | 2M | CO-4 | BL-3 |

PART-B

5X10=50M

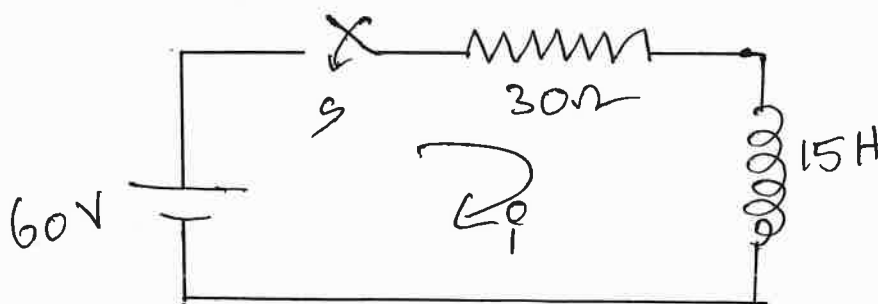
UNIT-1

- | | | | | | |
|---|----|---|----|------|------|
| 1 | a) | Derive an expression for current response of RLC series transient circuit with DC excitation. | 5M | CO-1 | BL-2 |
| | a) | The network shown in Fig. is under steady-state when the switch is closed. At $t=0$, it is opened. Obtain an expression for $i(t)$. | 5M | CO-1 | BL-3 |



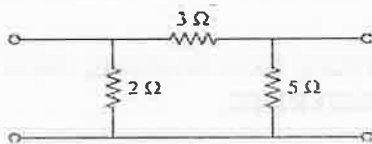
OR

- | | | | | | |
|---|----|--|----|------|------|
| 2 | a) | Derive the Transient Response of Series RL circuit with DC excitation. | 5M | CO-1 | BL-2 |
| | b) | A series RL circuit with $R=30\Omega$ and $L=15H$ as a constant voltage of $V=60V$ applied at $t=0$ as shown in figure. Determine current i , voltage across resistor and voltage across inductor. | 5M | CO-1 | BL-3 |

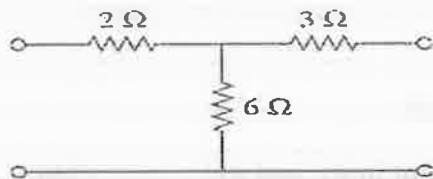


UNIT-II

- 3 a) Find the Z-parameters for the following circuit. 5M CO-2 BL-3

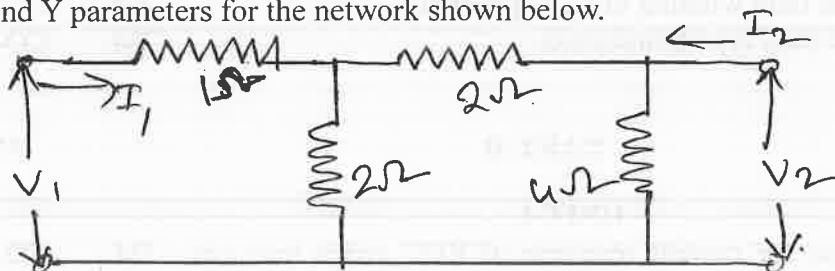


- b) Find the ABCD parameters for the following circuit. 5M CO-2 BL-3



OR

- 4 a) Find the relationship between Z and h parameters. 5M CO-2 BL-3
b) Find Y parameters for the network shown below. 5M CO-2 BL-3



UNIT-III

- 5 a) What is Nominal Impedance in constant-k low pass filter? 5M CO-2 BL-2
b) Explain the classification of filters with suitable graphs. 5M CO-2 BL-2
- 6 What is an m-derived filter? Explain the general configuration and parameters of m-derived low pass filter. 10M CO-2 BL-2

UNIT-IV

- 7 a) A 10 kW, 220 V DC machine has the following losses: Armature copper loss = 400 W, Field copper loss = 200 W, Iron and friction losses = 300 W. Find the efficiency of the machine as a generator and as a motor. 5M CO-3 BL-3
a) Explain the construction and working principle of a DC generator. 5M CO-3 BL-2
- OR
- 8 a) Derive the EMF equation of a DC generator. 4M CO-3 BL-2
b) Discuss the speed control methods of DC shunt motor. 6M CO-3 BL-2

UNIT-V

- 9 a) Draw and explain the phasor diagram of a transformer on load with lagging power factor. Also, derive the expression for voltage regulation. 5M CO-4 BL-3
b) Derive the EMF equation of single phase transformer with neat sketch. 5M CO-4 BL-3
- OR
- 10 a) Discuss the principle of operation of 3phase induction motor. 5M CO-4 BL-2
b) Discuss the working principle of an alternator. 5M CO-4 BL-2
