Name:.....
Roll No:.....

**MAR ATHANASIUS COLLEGE OF ENGINEERING**
**KOTHAMANGALAM – 686666**
**(Govt. Aided Autonomous Institution)**
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**B. TECH SECOND SERIES EXAMINATION, OCTOBER 2026**

**(S3 ECE A &B) B24EC2T03 NETWORK THEORY**

Max. Marks: 40 Duration: 1.5 Hours

***PART A***

***Answer all questions. Each question carries 3 marks.***

1. State and explain the Reciprocity Theorem, including its limitations. (CO2)

2. List the steps involved in determining the Norton's equivalent circuit for a circuit containing a dependent source. (CO2)

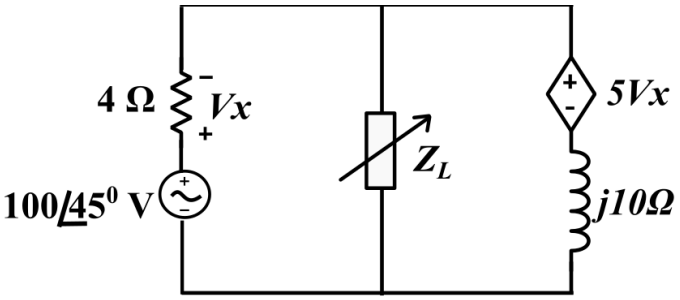
3. Derive the Laplace transform of a unit step signal. (CO3)

4. State initial value theorem and verify the initial value theorem for the function $e^{-t}(t+1)^2$ (CO3)

***PART B***

***Answer all questions. Each question carries 14 marks.***

5. An audio amplifier is connected to a loudspeaker represented by a load impedance $Z_L$. Determine the value of $Z_L$ required to obtain maximum power transfer from the amplifier to the loudspeaker. Also, calculate the maximum power delivered to the load. 14 marks (CO2)

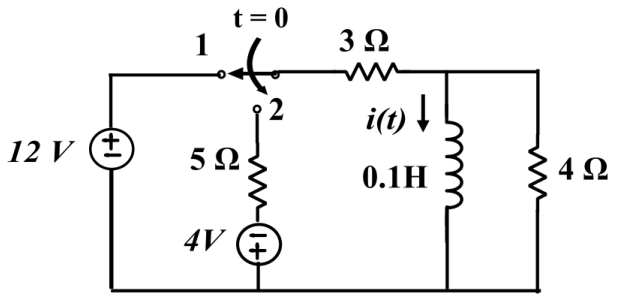



**VISION**
**Embedding Creativity and fostering quality Education**
**MISSION**
**Advance the field of Electronics and Communication by developing and disseminating innovative practices and technologies.**

**Nurture technically competent professionals in Electronics and Communication Engineering equipped with the skills to address global challenges.**

**Foster socially responsible technocrats and entrepreneurs who contribute positively to society through their expertise and leadership.**

6. A rechargeable battery-powered device has been connected to a charging circuit for a long time. At *t=0*, the switch is moved instantaneously from the charging position to the discharging position. Determine the current *i(t)* in the circuit. 14 marks (CO3)




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