



MANIPAL INSTITUTE OF TECHNOLOGY

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*(A constituent institution of MAHE, Manipal)*



# Basic Electrical Technology

## L00- Introduction

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# BET Faculty Team



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## MS Teams- Event Mode

- All students in Chem cycle are part of one BET team
- Uniformity in course content **delivery**

# Course Outline



## Basic Electrical Technology

### DC Circuit Analysis

- Circuit elements
  - Sources
  - Resistor
  - Inductor
  - Capacitor
- Mesh current analysis
- Node voltage analysis
- Superposition Theorem
- Thevenin's Theorem
- Max. Power Transfer Theorem

### Magnetic Circuits Analysis

- Magnetism
- Laws of magnetism
- Series and parallel magnetic circuits
- Electromagnetic induction
- Magnetic coupling
- Induced EMF
- Mesh analysis

### Single Phase AC Circuit Analysis

- Generation
- Representation
- AC through R, L and C
- Series and parallel circuits
- Power & power factor
- Resonance

### Three Phase AC Circuit Analysis

- Generation
- Representation
- Types of load connection
  - Star
  - Delta
- Analysis of balanced and unbalanced loads
- Measurement of Power

### Power System Components

- Generation – Transmission - Distribution
- Utilization of Electric power
- Electrical machines
  - Overview
  - Types
  - Working principle
  - Application
- Energy meters

$$[L T P C] = [2 1 0 3]$$

# Course Outcome

C01

- Analyze DC Circuit

C02

- Analyze Magnetic Circuit

C03

- Analyze Single Phase AC Circuit

C04

- Analyze Three Phase AC Circuit

C05

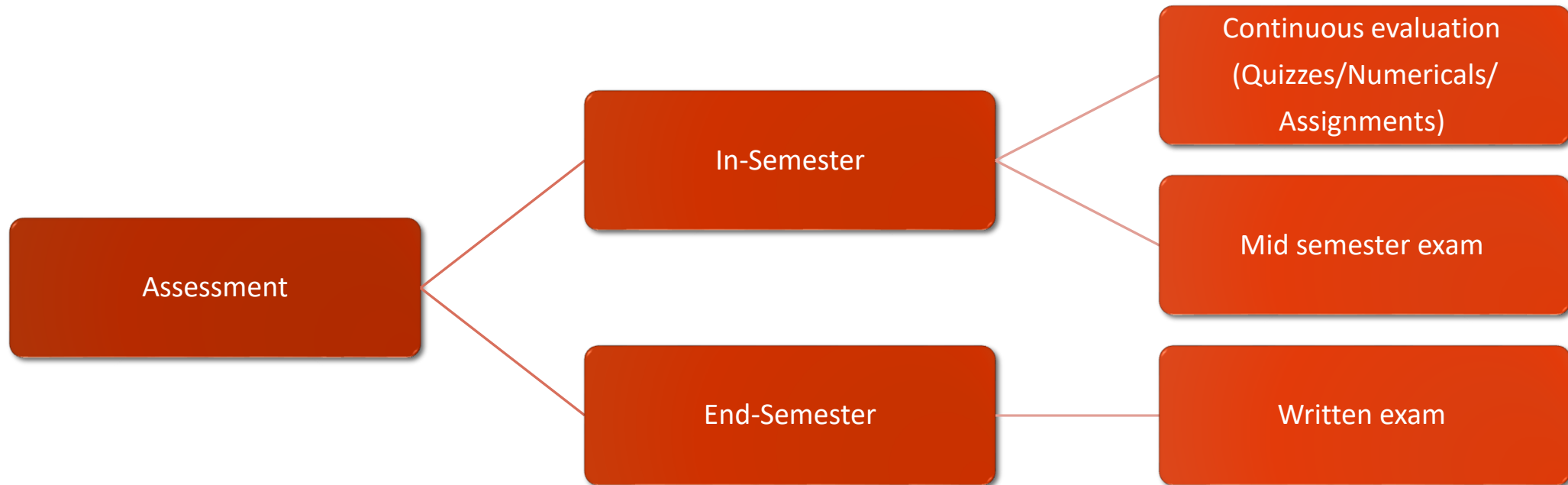
- Describe Electrical Power System Components

# References

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- 1. Hughes E., Electrical and Electronic Technology (9e), Pearson Education, 2008**
- 2. Kothari D. P. & Nagarath I. J., Basic Electrical Engineering, TMH 2013**
- 3. M Nahvi, Joseph Edminister, Electric Circuits (Schaum's Outline Series) 2017**
- 4. <http://www.nptel.ac.in/courses/108108076/>**
- 5. [http://www.nptel.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Basic%20Electrical%20Technology/New\\_index1.html](http://www.nptel.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Basic%20Electrical%20Technology/New_index1.html)**

# Assessment



**Note:**  
Detailed course plan & assessment plan will be shared with you in due course of time

# Student Query Resolution

Connect with  
1 faculty

Email to

ONLY for BET related  
query

*[bet.eee@manipal.edu](mailto:bet.eee@manipal.edu)*

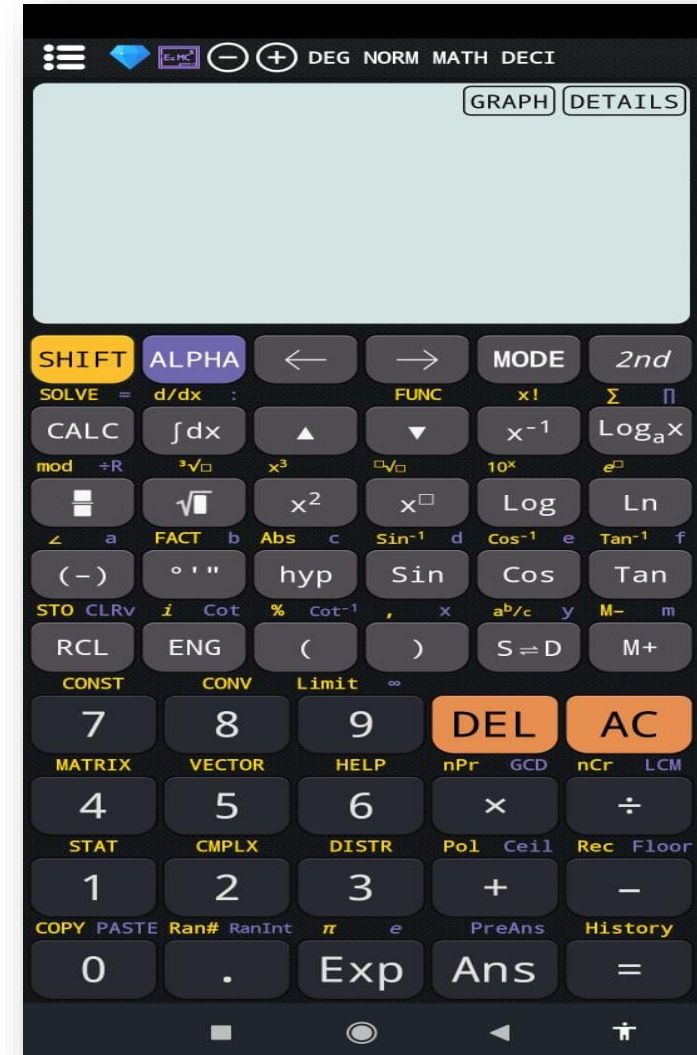


# You Need



## A Scientific Calculator

- Physical calc.
- [Click Here for App Link](#)



# Quick Question

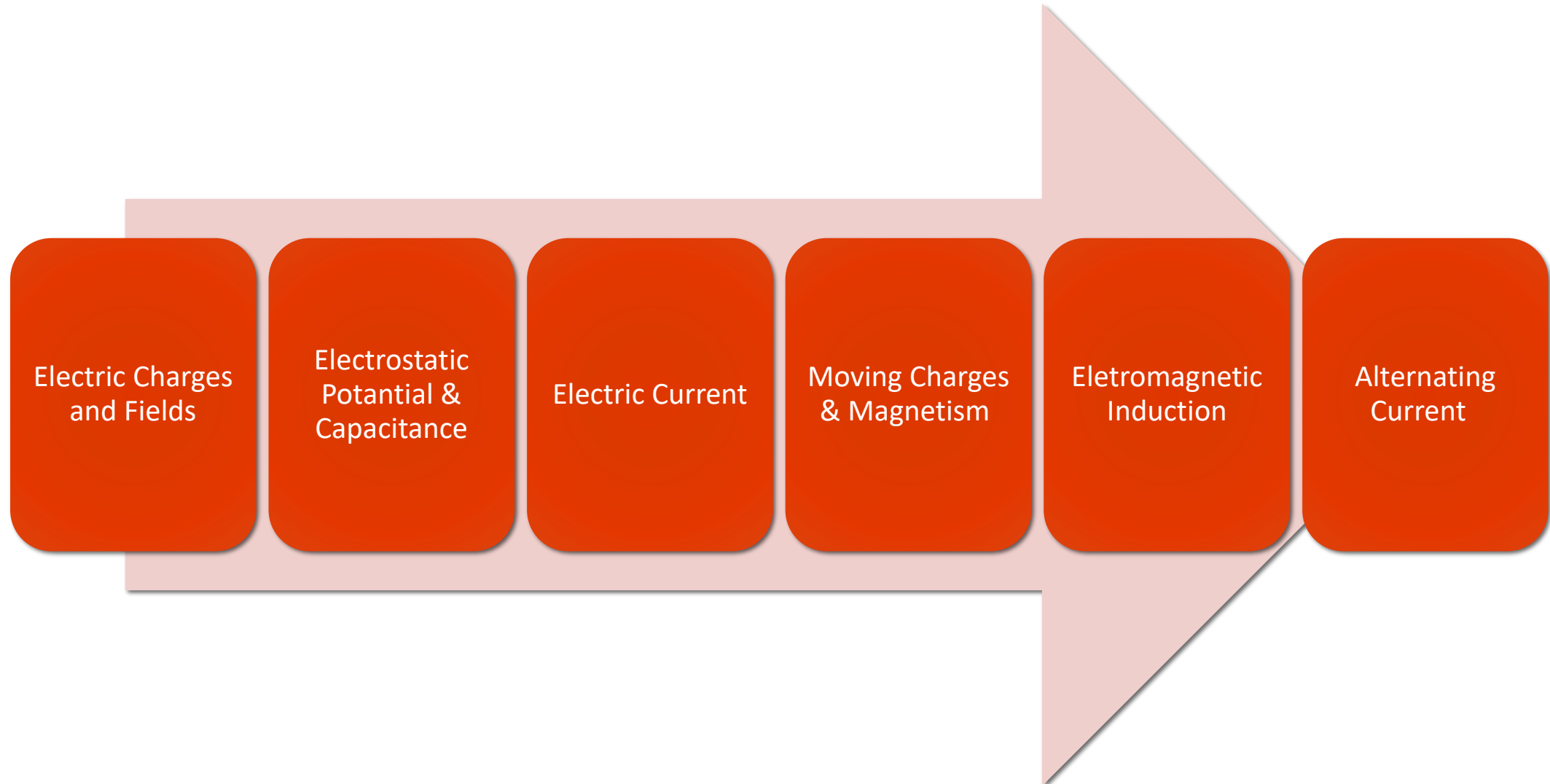
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Your 12th/P.U.C. board was \_\_\_\_\_

- a) CBSE
- b) ICSE
- c) State
- d) Others

# Quick Recap





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# Quiz Time

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# Quiz 1 of 5

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The electrical installations at our home are connected in \_\_\_\_\_

- A) Series
- B) Parallel

# Quiz 2 of 5

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**Two electric bulbs have filaments of same thickness. When connected to the same source, one of them consumes 60W and other one consumes 100W. Then**

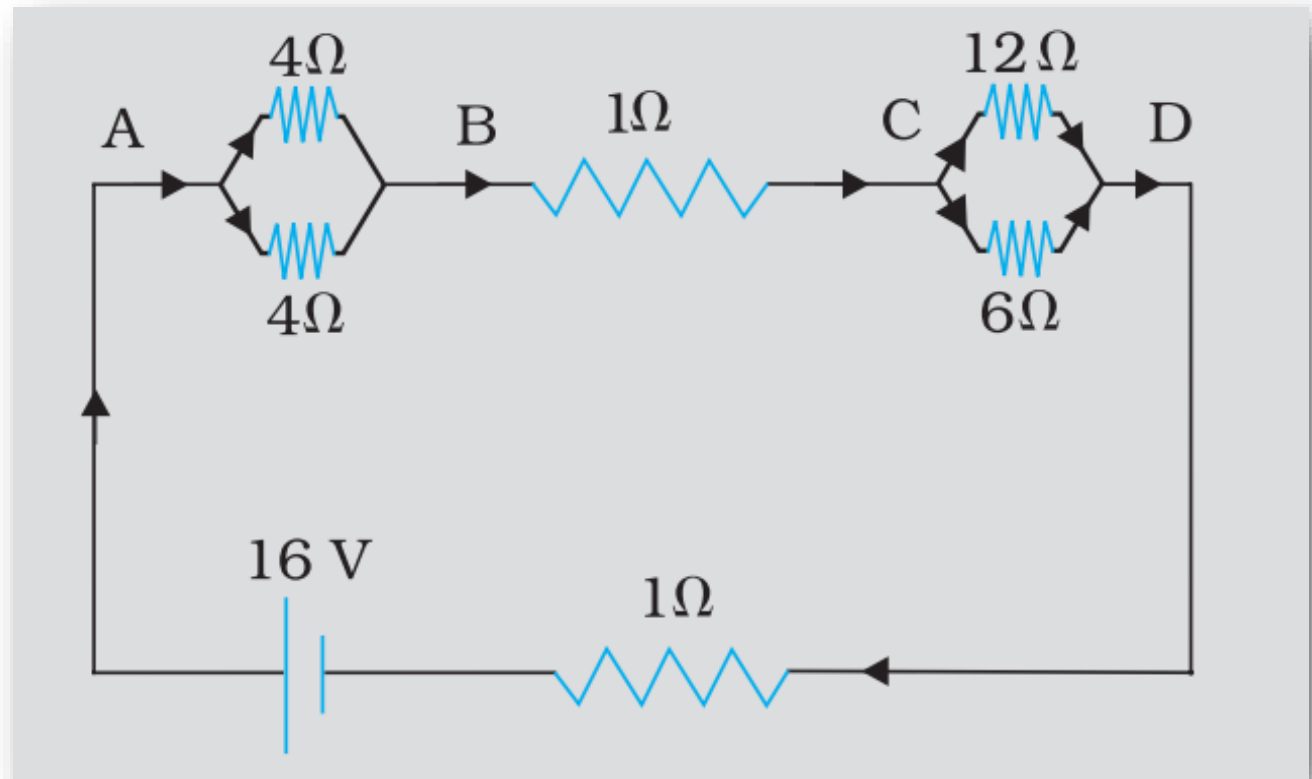
- a) 60W lamp filament has shorter length
- b) 100W lamp filament has longer length
- c) 60W lamp filament has longer length
- d) Both have equal length

# Quiz 3 of 5



A network of resistors is connected to a 16 V battery with internal resistance of  $1\Omega$ , as shown below. The voltage drop  $V_{CD}$  is \_\_\_\_\_

- a) 4 V
- b) 2 V
- c) 8 V
- d) 16 V

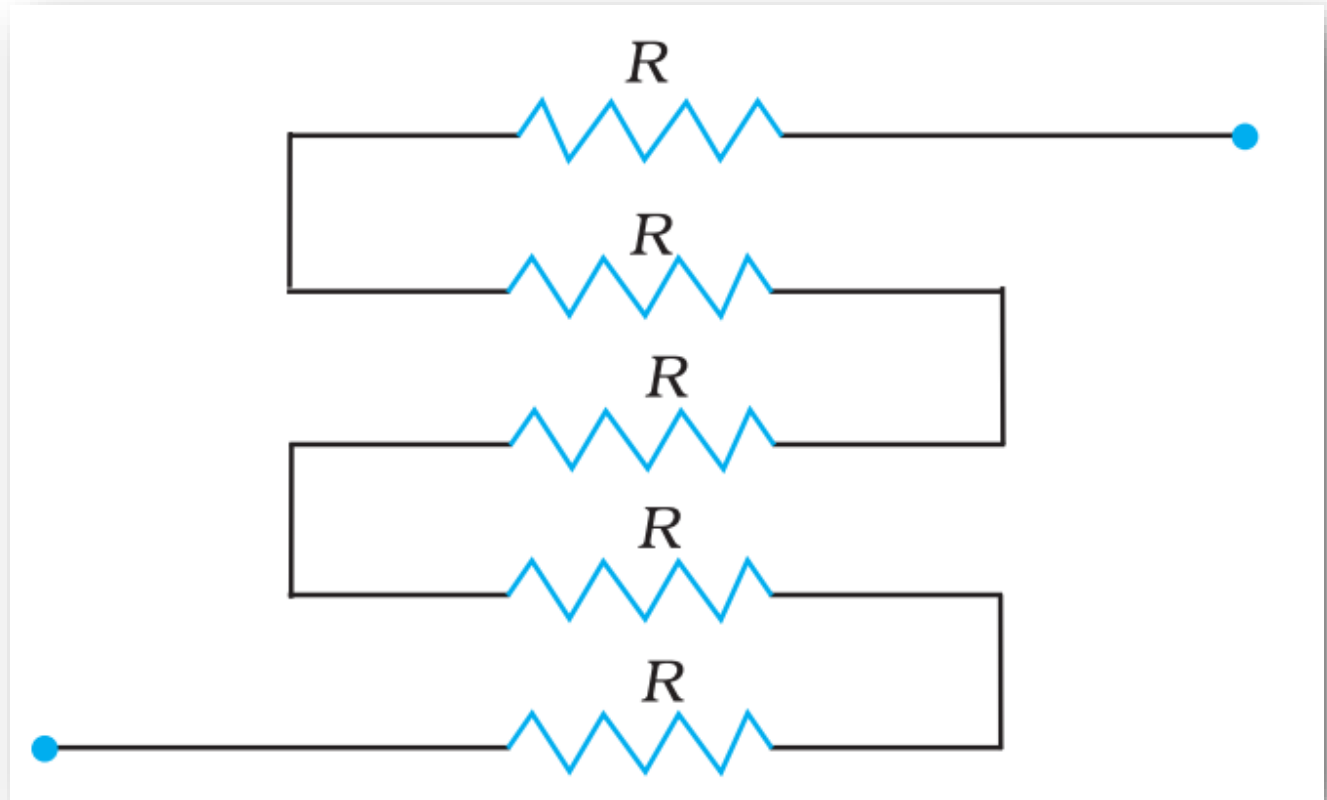


# Quiz 4 of 5



In the circuit shown, the equivalent resistance of the network shown is

- \_\_\_\_\_
- A)  $R/5 \Omega$
  - B)  $5R \Omega$
  - C)  $6R/5 \Omega$
  - D)  $2R \Omega$



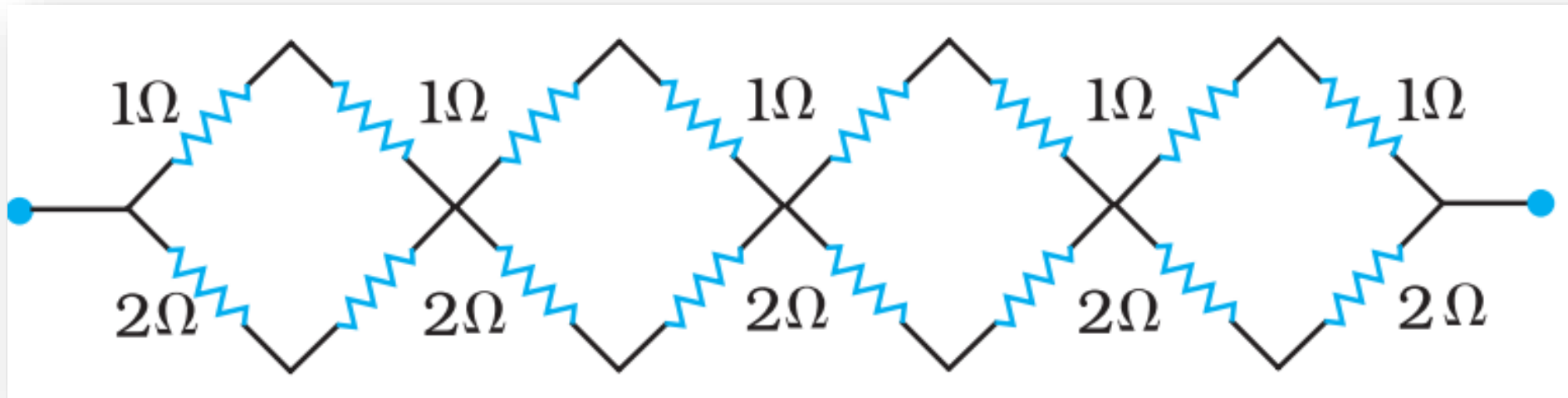


# Quiz 5 of 5



The equivalent resistance of the network shown is \_\_\_\_\_

- A)  $16/3 \Omega$
- B)  $10/3 \Omega$
- C)  $15/3 \Omega$
- D)  $15 \Omega$



# Reference

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- **Source of pictures in Slides 14, 15 & 16:**
  - [http://ncertbooks.prashanthellina.com/class\\_12.Physics.PhysicsPartI/Chapter%2003.pdf](http://ncertbooks.prashanthellina.com/class_12.Physics.PhysicsPartI/Chapter%2003.pdf)