

ELEMENTS OF ELECTRICAL ENGINEERING

Course Code : UE25EE141A/B



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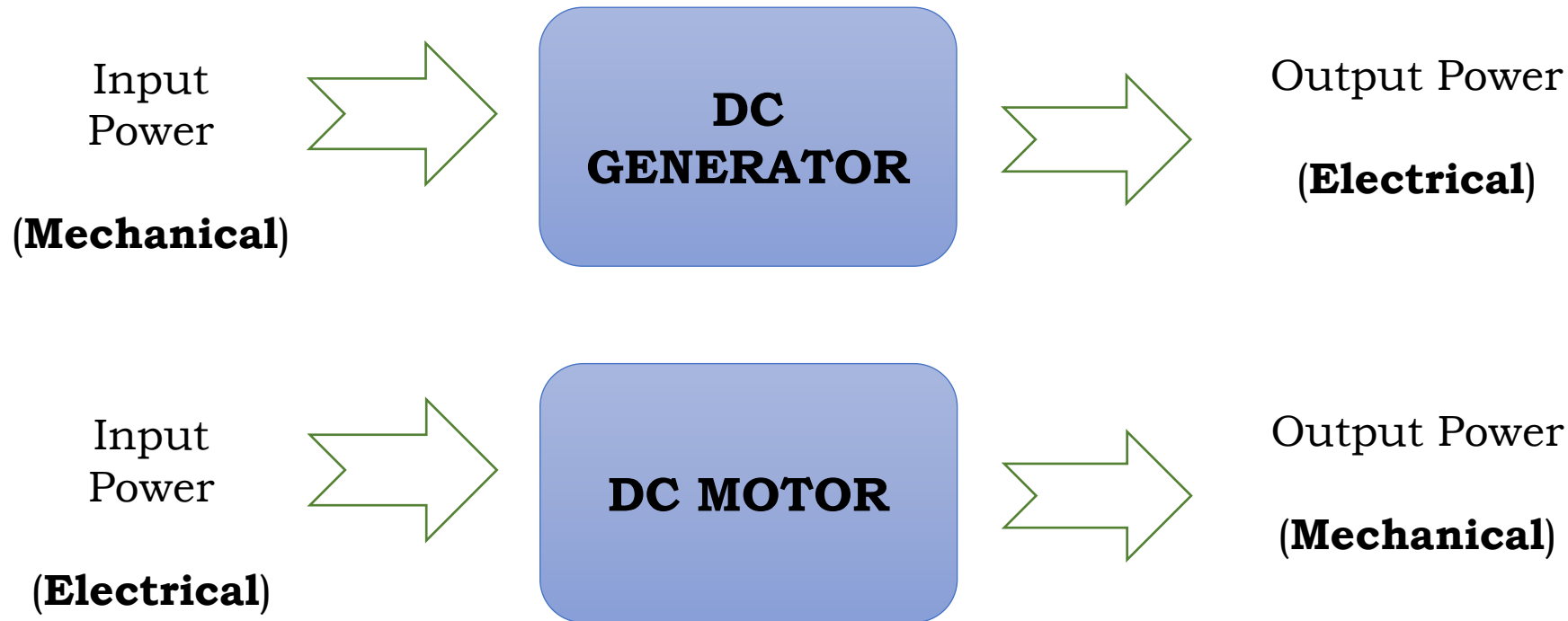
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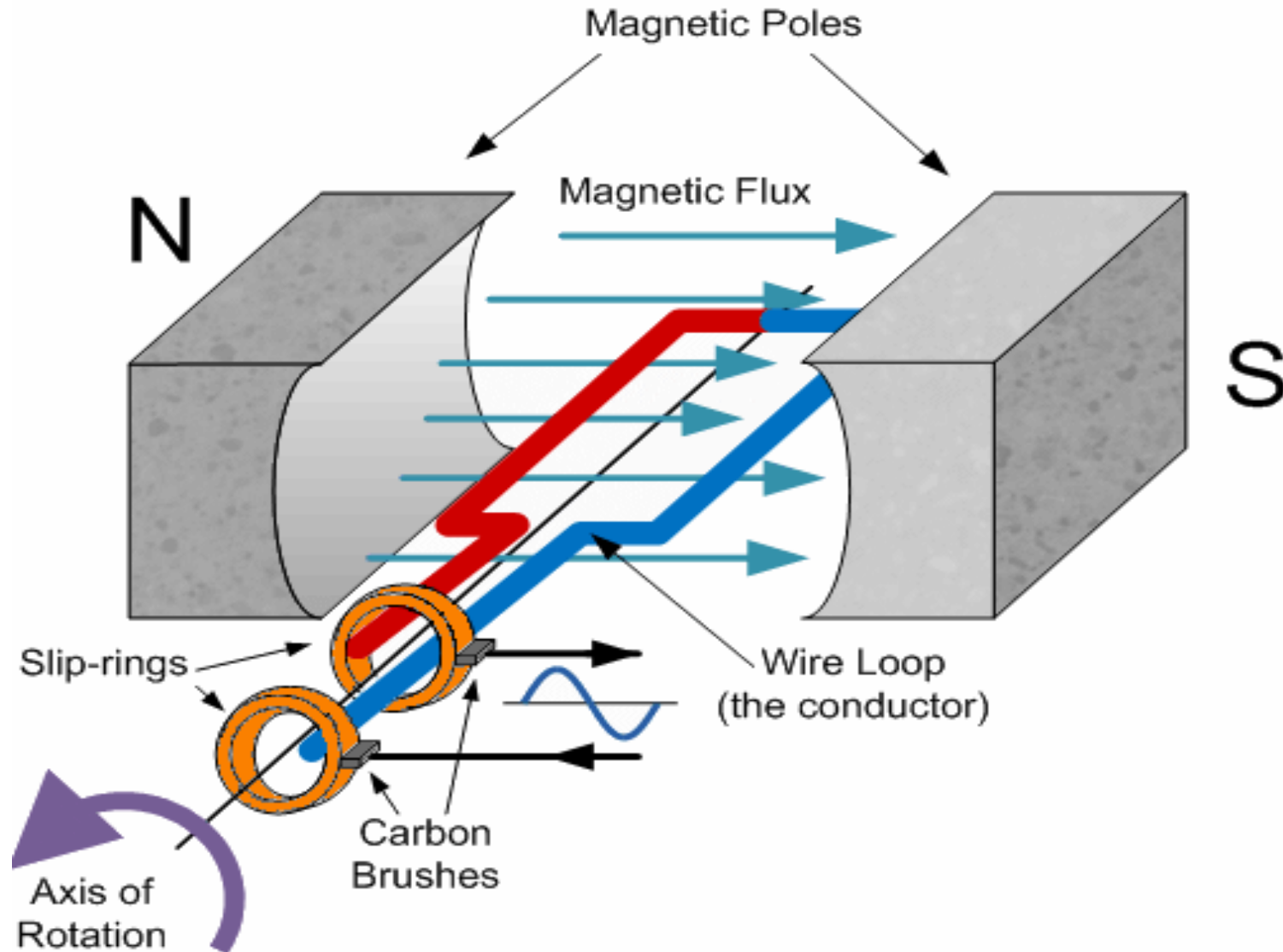
DC MACHINE : CONSTRUCTION

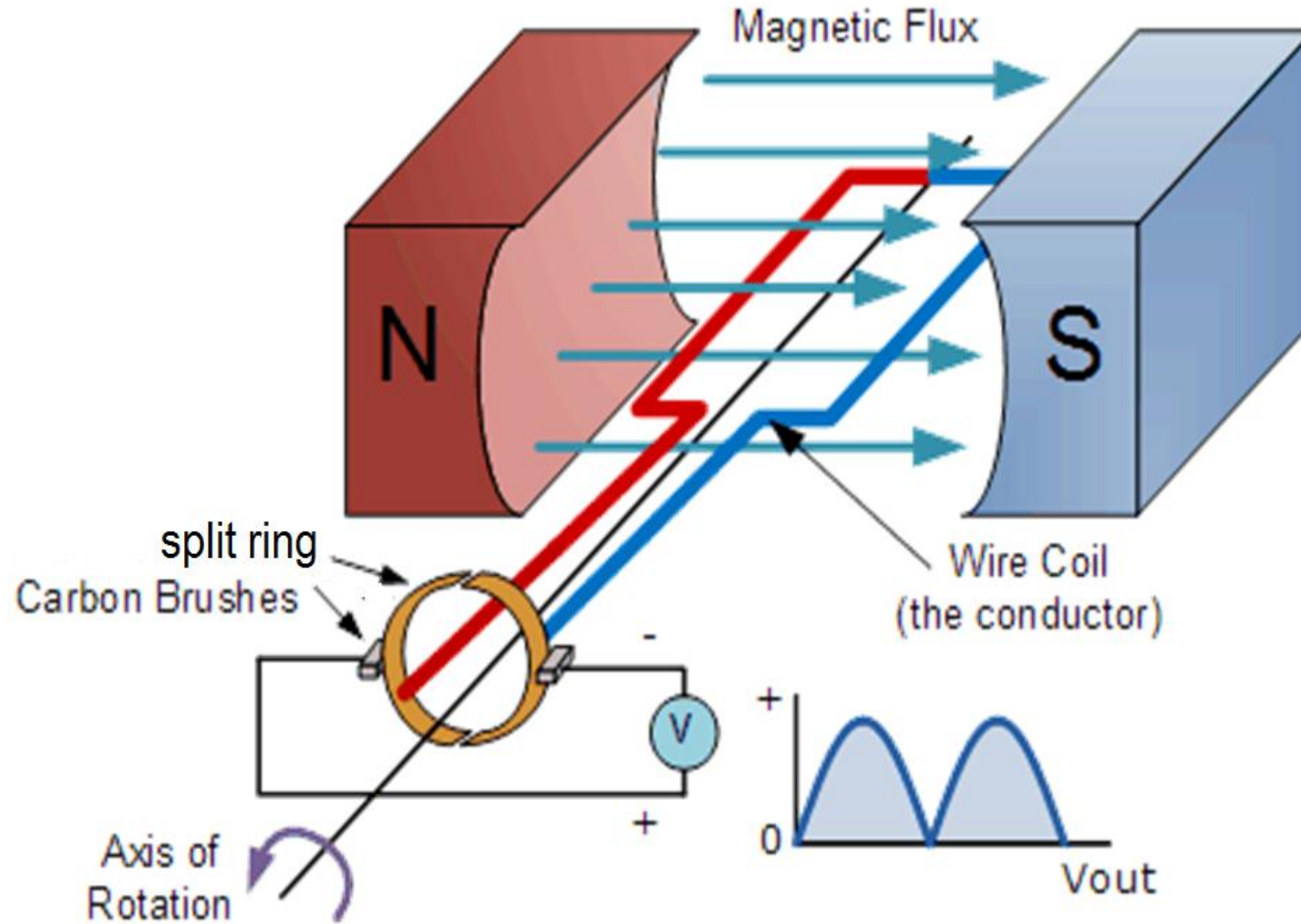
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A DC Machine is an electromechanical energy conversion device which converts mechanical power to electrical power or vice versa

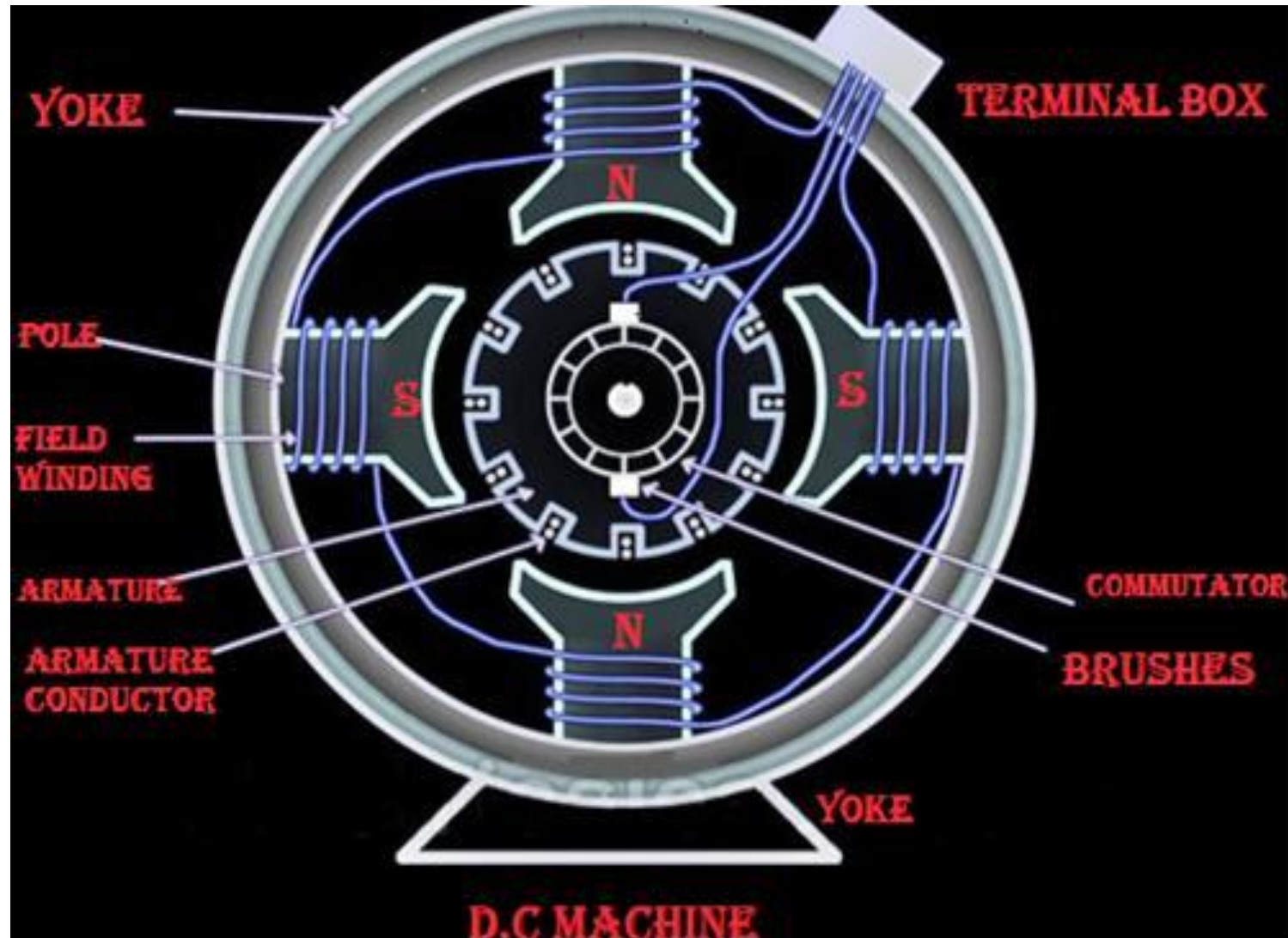


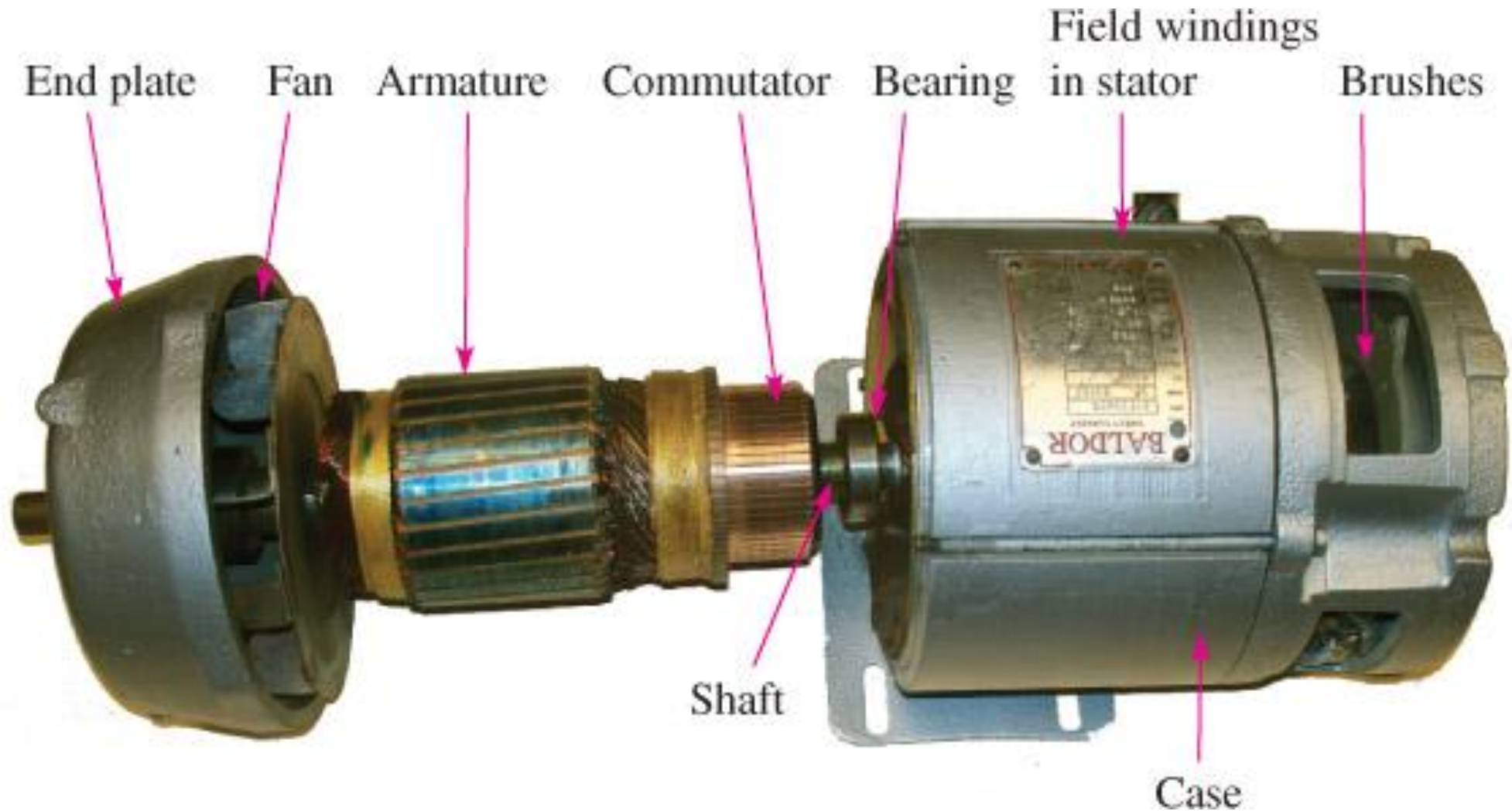




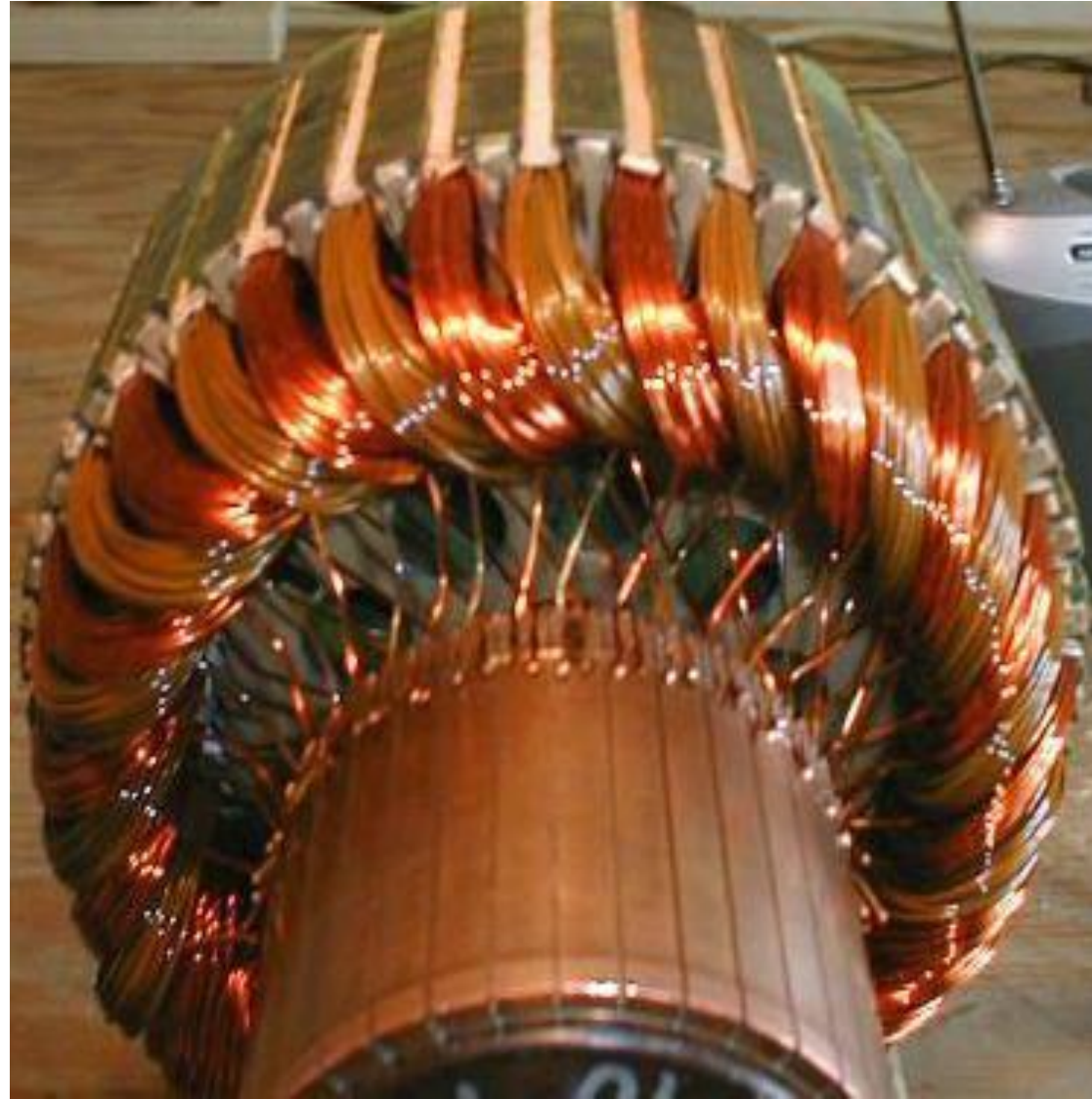
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Construction of DC Machine



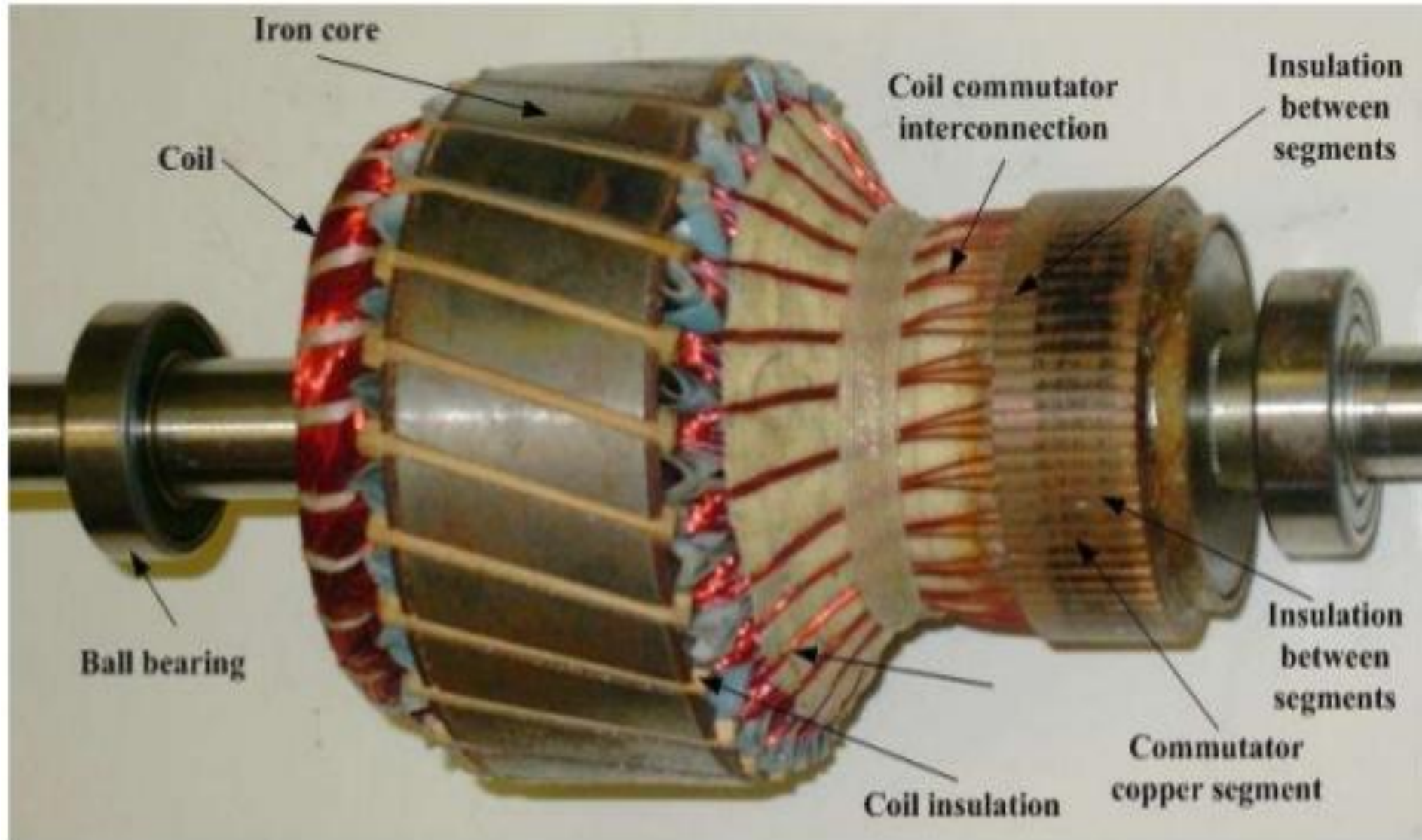


Armature Rotor



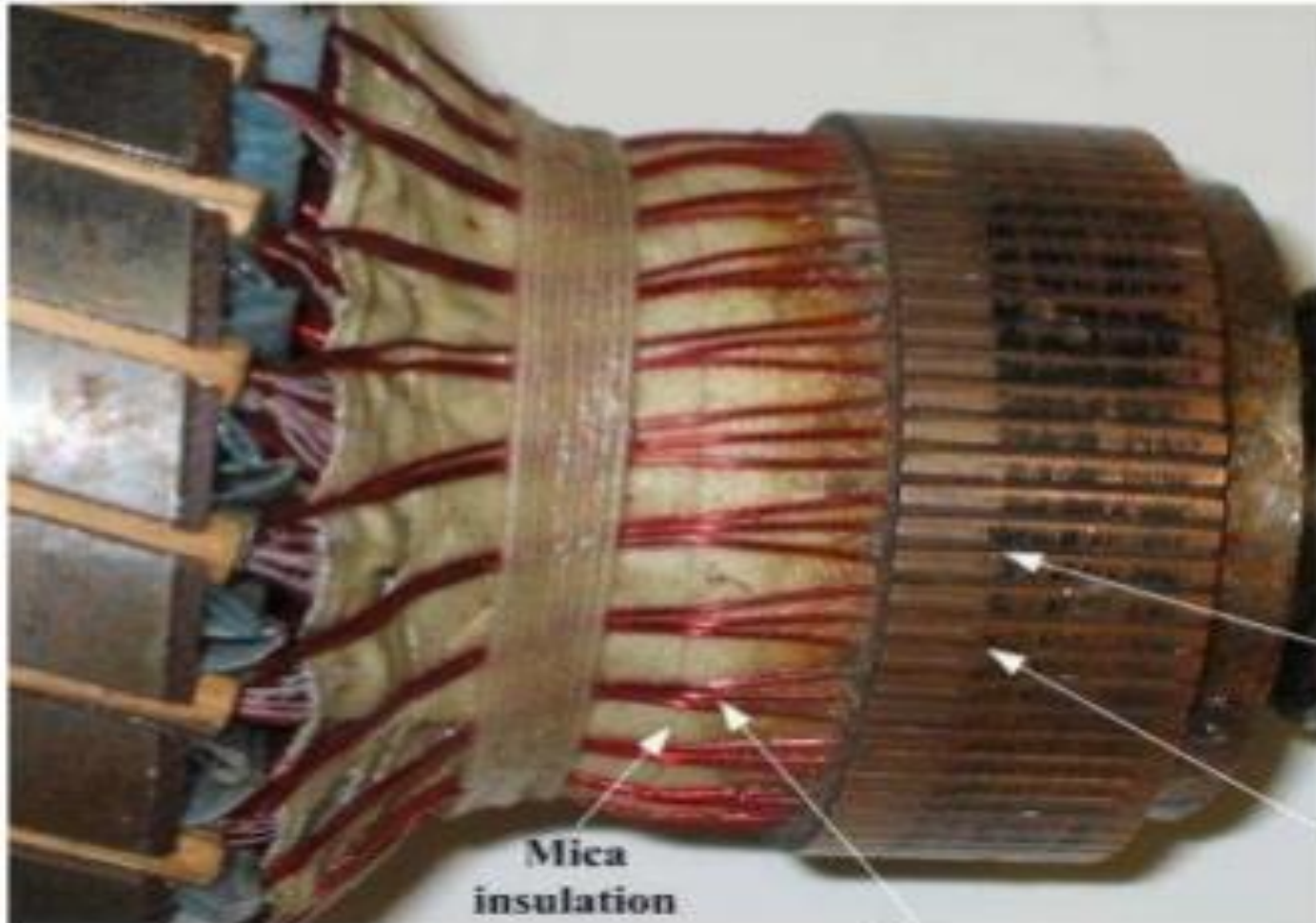
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Armature of DC Machine



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Armature of DC Machine



Mica
insulation

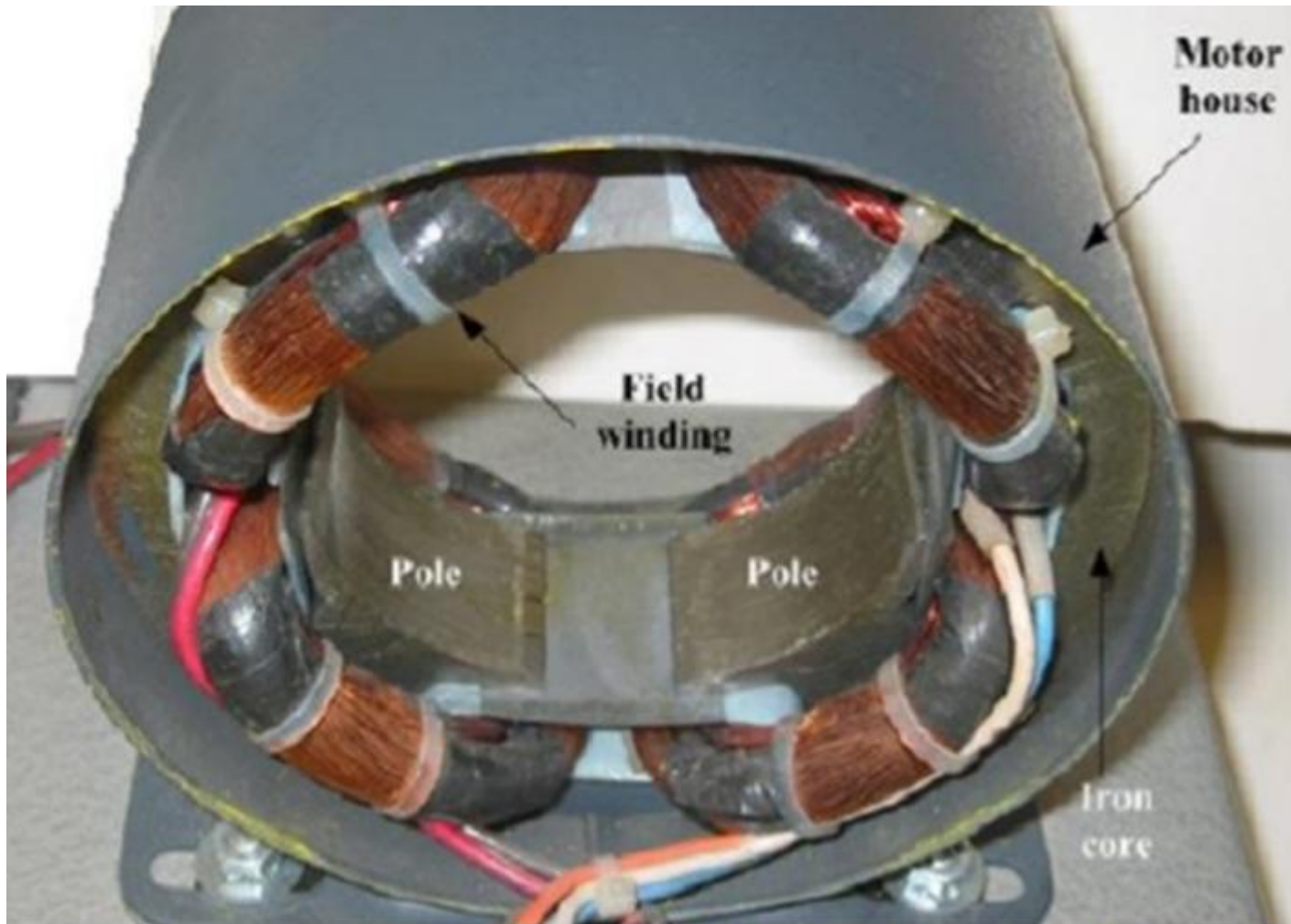
Copper
conductors



Carbon Brushes

Mica Insulation
between segments

Copper
segment



Armature Winding of a DC Machine is wound by one of the two methods

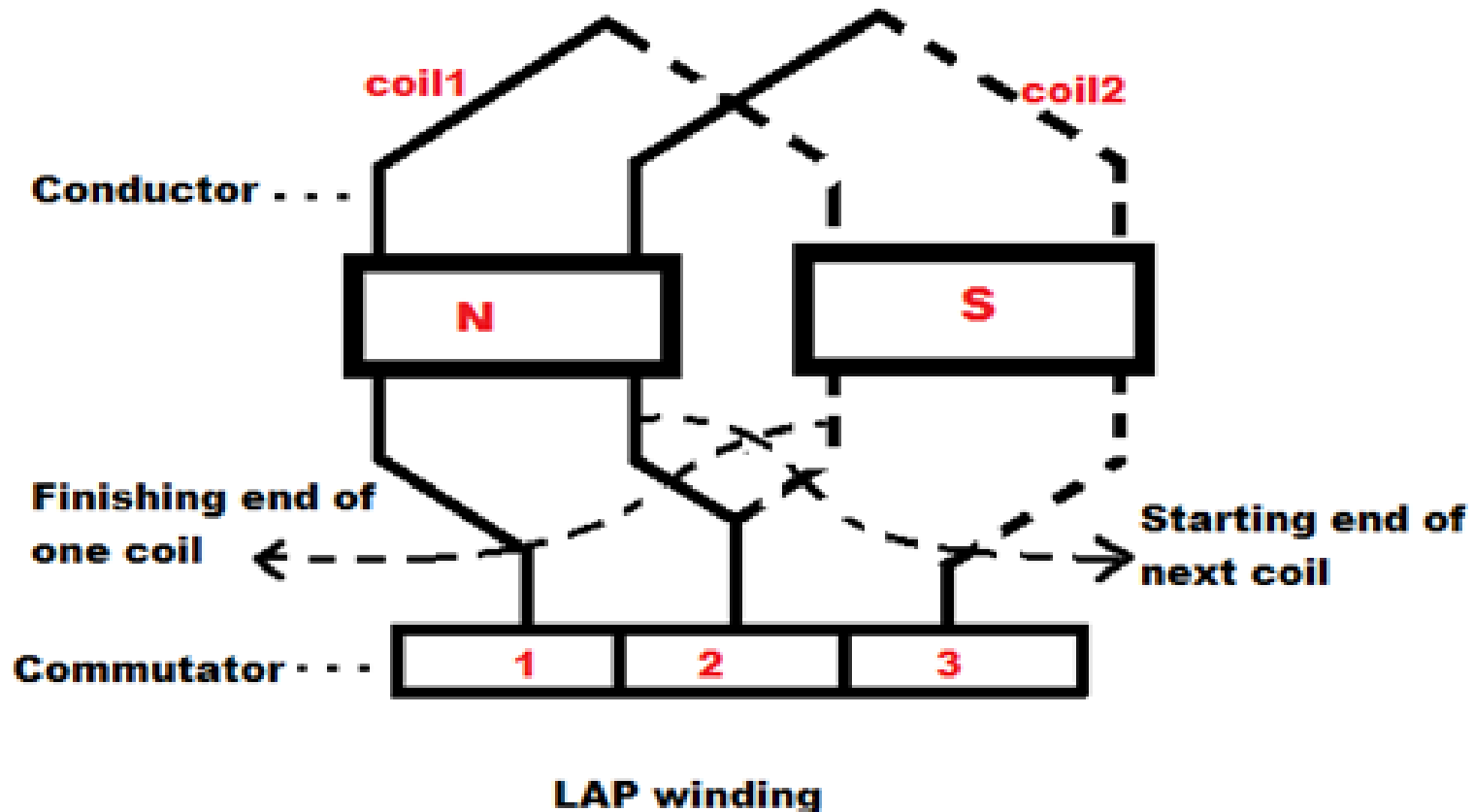
Lap Winding

Wave Winding

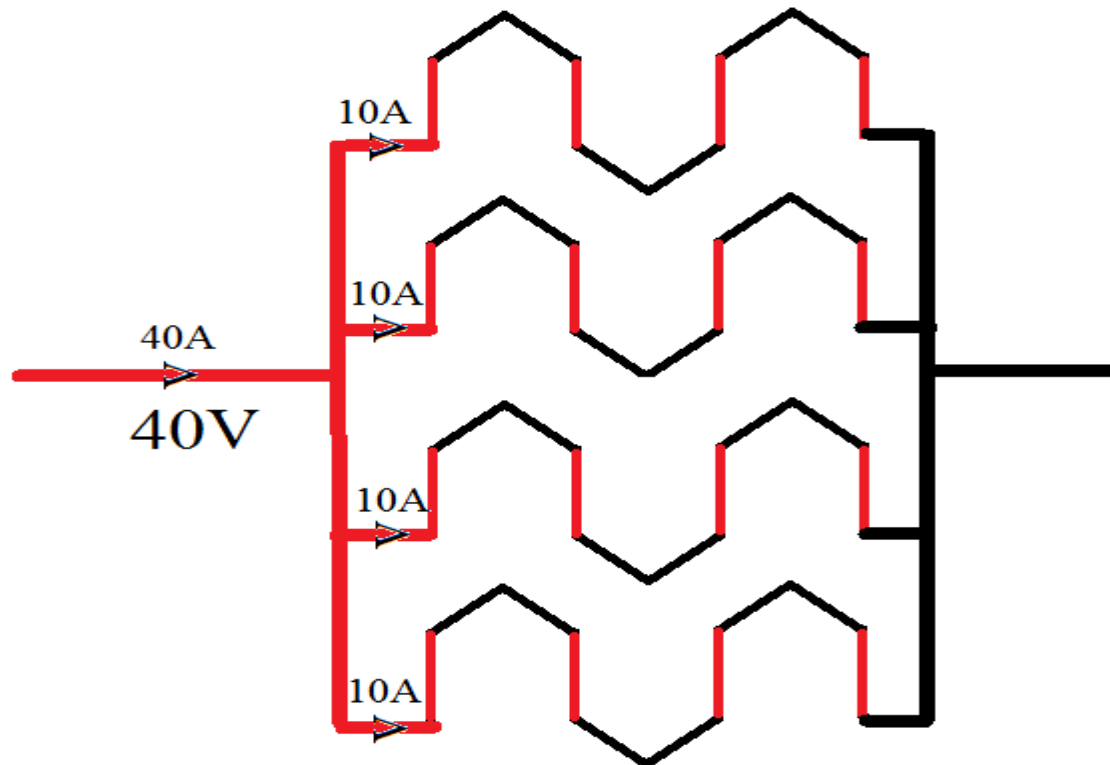
The difference between these two is merely due to the end connections and commutator connections of the conductor.

It may be simplex, duplex or multiplex.

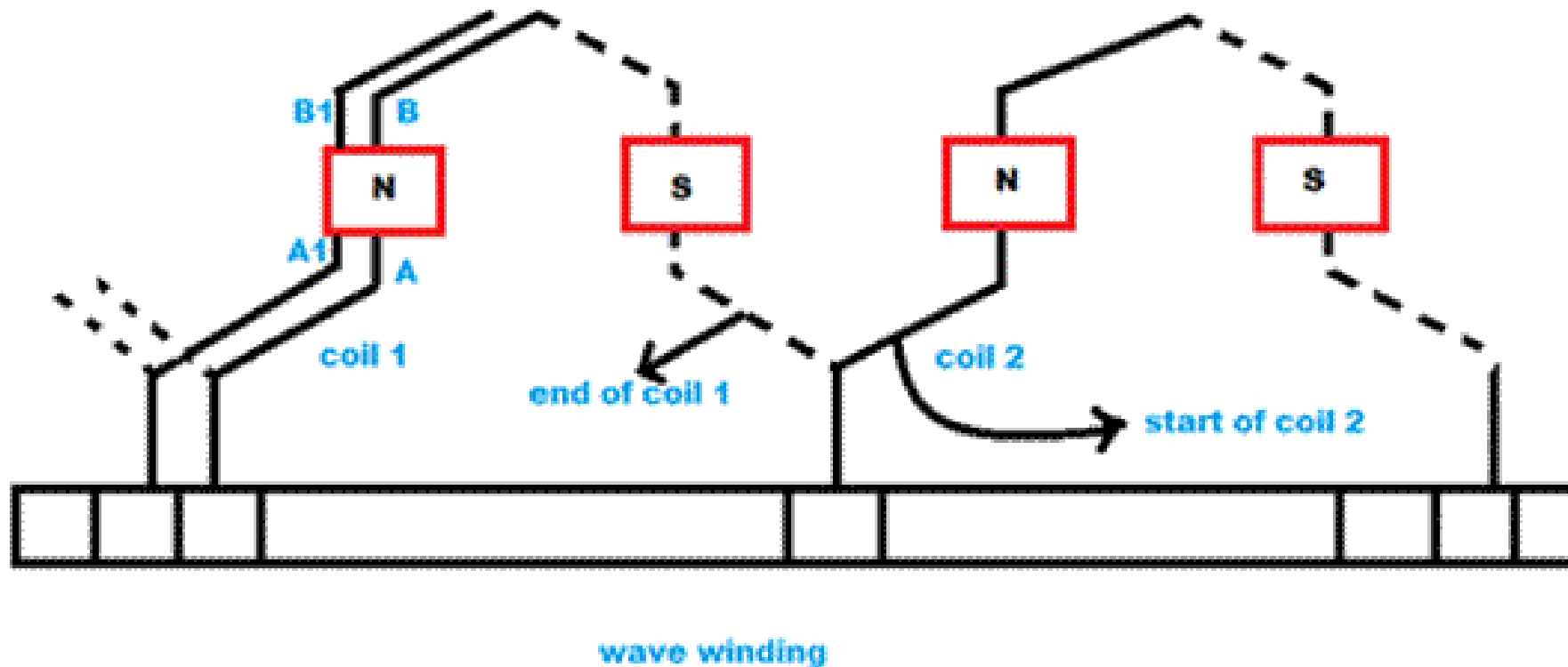
In a simplex lap winding, the two ends of a coil are connected to adjacent commutator segments.



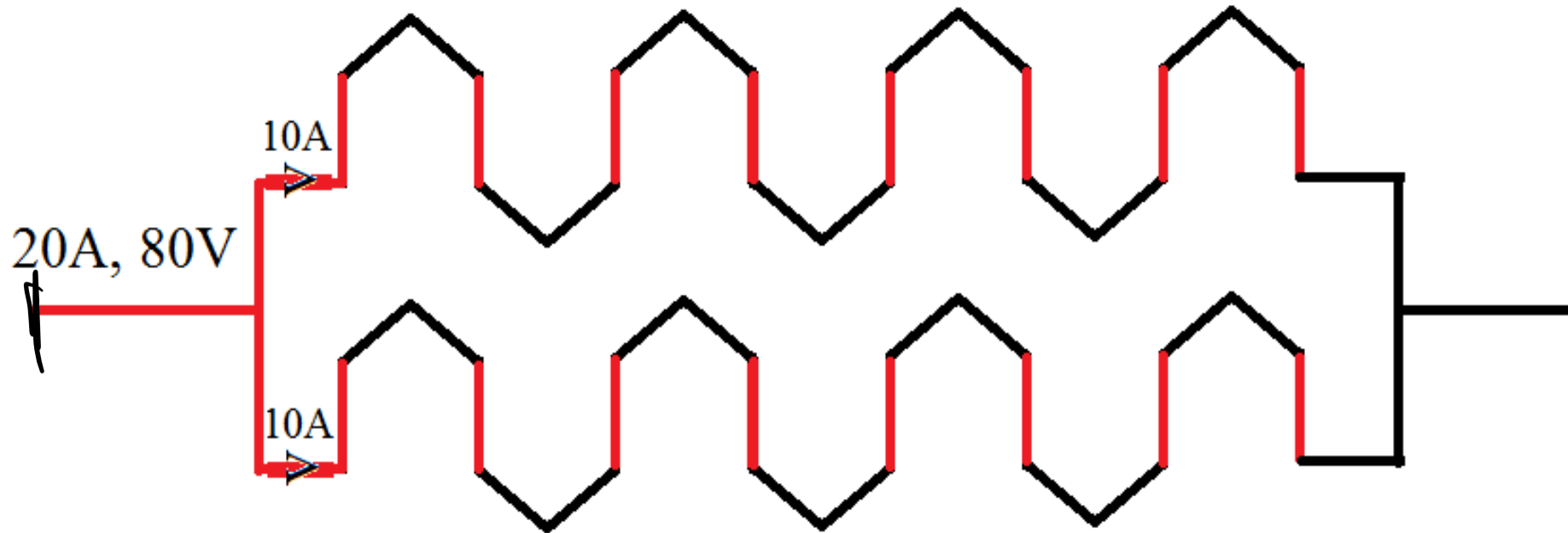
- No of parallel paths(A) is equal to the no of poles(P), ($A=P$).
- Let $Z=16$, $P=4$, $V(\text{per conductor})=10\text{V}$, $I(\text{per conductor})=10\text{A}$
- High current, low voltage



A conductor under one pole is connected at the back to a conductor which occupies an almost corresponding position under the next pole which is of opposite polarity.



- No of parallel paths(A) is always equal to 2, ($A=2$)
- Let $Z=16$, $P=4$, $V(\text{per conductor})=10\text{V}$, $I(\text{per conductor})=10\text{A}$
- Low current, High voltage



Text Book:

1. “Basic Electrical Engineering” S.K Bhattacharya, 1stEdition Pearson India Education Services Pvt. Ltd., 2017
2. “Basic Electrical Engineering”, D. C. Kulshreshta, 2ndEdition, McGraw-Hill. 2019
3. “Special Electrical Machines” E G Janardanan, PHI Learning Pvt. Ltd., 2014

Reference Books:

1. “Engineering Circuit Analysis” William Hayt, Jack Kemmerly, Jamie Phillips and Steven Durbin, 10th Edition McGraw Hill, 2023
2. “Electrical and Electronic Technology” E. Hughes (Revised by J. Hiley, K. Brown & I.M Smith), 12th Edition, Pearson Education, 2016.



THANK YOU

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