PHYSICS

ELECTRICITY

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Electricity

1. **Electricity** is the set of physical phenomena associated with the presence and flow of electric charge.
2. **Electrons** have a negative charge.
3. An **Electric (force) field** surrounds any charged object - it spreads out - weakens with distance.
4. Charge is measured in **Coulombs.**
5. **1 Coulomb =1 amp per second.**
6. In a good **conductor** the valence electrons can be easily forced to move from one atom to the next.

7. A **conductor** is a material that has a large number of free electrons that continually jump to other atoms.

8. Good electrical **conductors** are copper and aluminium. Gold, silver, and platinum are also good conductors, but are very expensive.

9. An **insulator** is a material that has only a few free electrons. In insulators, the electrons are tightly bound by the nucleus.

10. Good electrical insulators are **Rubber, Porcelain, Glass, and Dry Wood.**

11. **Current (I)** is the movement of charge through a conductor. Electrons carry the charge.

12. Unit of measurement current is **Amperes (A)**.

13. The fundamental electric quantity is. **Charge.**

14. **Current** is rate of flow of negatively-charged particles, called electrons, through a predetermined cross-sectional area in a conductor.

15. **Resistance** - The ability to resist current leakage through and over the surface of the material.

16. The resistance, expressed **in ohms (named after George ohm)**

17. Resistance depends on **Resistivity, Length, Cross-sectional area and Temperature.**

Resistance Colour Code

Color	Digit	Multiplier	Tolerance (%)
Black	0	10^0 (1)	
Brown	1	10^1	1
Red	2	10^2	2
Orange	3	10^3	
Yellow	4	10^4	
Green	5	10^5	0.5
Blue	6	10^6	0.25
Violet	7	10^7	0.1
Grey	8	10^8	
White	9	10^9	
Gold		10^{-1}	5
Silver		10^{-2}	10
(none)			20

18. **Ammeter** is used to measure amount of current.

19. **Voltmeter** is used to measure potential difference between two points.

20. Instrument used to measure resistance is **Ohm meter.**

21. A **capacitor** is an energy storage element.

22. It can store **electrical voltage** for periods of time.

23. A Capacitor consists of **two conducting metal plates** with an insulating sheet of material in between.

24. When a capacitor has a difference in voltage across its plate, it is said to be **charged**.

25. Unit of capacitance is **Farad.**

26. **Inductance (L)** is the property of an electrical circuit that opposes change in current**.**

27. **Inductor** is a passive energy storage element that stores energy in the form of magnetic field.

28. The **henry (symbolized H)** is the Standard International (SI) unit of inductance.

29. **Ohm's law** states that electric current is proportional to voltage and inversely proportional to resistance.

30. When current flows through a conductor, **heat energy** is generated in the conductor.

31. The heating effect of an electric current depends on **resistance, amount of current and time for which current flows**.

32. Heating effect of current is used in Iron box, electric water heater, etc.

33. The magnetic field carries the invisible force of **magnetism.**

34. Wherever an electric current exists, a magnetic field also exists.

35. Whenever current flows through a conductor, a **magnetic field** is created around the conductor.

36. **Rule** for remembering the direction of the **magnetic field around a conductor** is called the **right-hand** clasp **rule.**

37. If a person grasps a **conductor** in one's **right hand** with the **thumb** pointing in the direction of the current, the fingers will circle the **conductor** in the direction of the **magnetic field**.

38. An **electromagnet** is a type of magnet in which the magnetic field is produced by an electric current.

39. In electromagnets, magnetic field disappears when the **current is turned off.**

40. Electromagnets are used in **motors, generators, relays, loudspeakers, hard disks, MRI machines, scientific instruments, and magnetic separation equipment.**

41. **Electromagnetic Induction** creates a voltage or current in a conductor when a magnetic field change.

42. In a transformer, alternating current in one winding induces a changing magnetic field in the transformer core

43. **Transformer** work on the principle of **Electromagnetic induction**.

44. In **Generator** magnetic field of the rotor Induces a voltage in the stator windings.

45. Electromagnetic induction was first discovered by **Michael Faraday.**

46. **Dynamo** works on the basis of Faraday's law.

47. Whenever a magnetic field is moved past a conductor a voltage is induced in the conductor.

48. **Farad determined that a capacitor has a value of one farad of capacitance if one volt of potential difference applied across its plates moved one coulomb of electrons from one plate to the other.**

49. **Electric bell** functions by means of an electromagnet.

50. **Lenz's law** states that the polarity of the induced emf is such that it tends to produce a current

which opposes the change in magnetic flux that produces it.

51. When a current in a coil changes, it induces a **back emf** in the same coil.

52. The magnitude of the **induced emf** in a circuit is equal to the time rate of change of magnetic flux through the circuit.

53. The induced emf can be increased by increasing the **number of turns** N of a closed coil.

54. By accelerating magnet inside coil, **current** in it increases.

55. Total number of magnetic field lines passing through an area is called **magnetic flux**.

56. Magnitude of **induced e.m.f** is proportional to rate of change of magnetic flux linkage.

57. In transformer, core is made up of soft iron in order to pass maximum **magnetic flux**.

58. Currents that flow in circles inside a disc are known as **eddy currents**.

59. When field is parallel to plane of area, magnetic flux through coil is **zero**.

60. An open coil has **infinite resistance and zero inductance.**

61. In case of an inductance, current is proportional to magnetic field.

62. For a purely inductive circuit Actual power of the circuit is **zero**.

63. Lenz's law is a consequence of the **law of conservation of energy**.

64. The co-efficient of coupling between two air core coils depends on

mutual inductance and self-inductance of two coils.

65. A crack in the magnetic path of an inductor will result in **reduced inductance.**

66. Inductance will oppose the change in circuit current.

67. **Weber** is the unit of magnetic flux.

68. A.C cannot be used for **magnetizing and electroplating**.

69. Inductors acts as a short circuit for DC.

70. Long distance transmission is easy for AC.

71. When the motor is at its maximum speed then back emf will be **maximum.**

72. Reluctance in a magnetic material is a property by virtue of which it opposes the creation of **Magnetic flux.**

73. **Coulomb's First Law** states that unlike poles attract each other and like poles repel each other**.**

74. The electrical entity inductance can be compared to the mechanical entity **inertia**.

75. In electroplating, solution must be of **salt of metal** to electroplate with.

76. Types of electrodes used during electrolysis affect the **products of electrolysis**.

77. A **battery** converts chemical energy to electrical energy.

78. When electric current is passed through a bulb, the bulb gives light

because of **heating effect of current.**

79. The process of producing chemical decomposition of a compound by passing electricity through the compound is called **electrolysis.**

80. The filament used in in electric heater is of **high resistance.**

81. Mica is **bad conductor of electricity** but good conductor of heat**.**

82. Conversion of temperature into electric voltage is done with **thermistor.**

83. Wire wound variable resistance is known as **rheostat.**

84. Potential difference between ends of conductor maintained by battery is **constant.**

85. SI unit of conductivity of material is**Ω-1m-1.**

86. **Ohmic devices** are devices that consequently obey Ohm's law.

87. Filament bulbs are best examples of the **non-ohmic devices**

88. Reciprocal of resistance is called **conductance.**

89. Living creature that turns itself into living battery is **eel.**

90. Characteristic specific resistance of wire is its **resistivity.**

91. Sunlight is directly converted into electrical energy by using **solar cells.**

92. To pass current through ammeter it should be connected in **Series** in circuit.

93. Inside a hollow conducting sphere **electric field is zero**.

94. To obtain a high value of capacitance, the permittivity of dielectric medium should be **high**.

95. 1 F is theoretically equal to **ratio of 1 C to 1 V.**

96. Bulb in street lighting are connected in parallel.

97. Third pin of a 3-pin plug is thicker and longer for **protection purpose**.

98. Our household apparatus is connected in **parallel.**

99. Internal resistance of ideal voltage source is **zero.**

100. Internal resistance of ideal current source is **infinity.**