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Current and Electricity

Chapter No.13 (MCQs)

1. If a wire of uniform area of cross section is cut into two halves (equal in size), the resistivity of each part will be:

- a) Halved.
- b) Doubled.
- c) Becomes four times its initial value.
- d) Remains the same

2. Electric current flowing through a conductor is:

- a) The flow of electrons through a cross section of the conductor.
- b) Rate of flow of protons through a cross section of the conductor.
- c) Rate of flow of electrons through a cross section of the conductor.
- d) Rate of flow of charges through a cross section of the conductor.

3. The S.I unit of electric current is:

- a) Coulomb.
- b) Volt.
- c) Ampere.
- d) Ohm.

4. A dry cell supplies:

- a) D.C. Only.
- b) A.C. only.
- c) Sometime D.C. sometimes A.C.

5. When a battery of V volts is connected across a bulb of filament resistance R. as a result of which current I flows through it, power consumed by it is given by:

- a) $V^2 I$.
- b) $V I^2$.
- c) V/I .
- d) $V I$.

6. In a dry cell electrical energy is obtained due to the conversion of:

- a) Mechanical energy.
- b) Heat energy.
- c) Solar energy.
- d) Chemical energy.

7. An ampere is equivalent to:

- a) Coulomb/meter.
- b) Coulomb/volt.
- c) Coulomb/second.
- d) Coulomb/minute.

8. In an alternating current generator, electrical energy is obtained due to the conversion of:

- a) Mechanical energy.
- b) Heat energy.
- c) Solar energy.
- d) Chemical energy.

9. Electric current through most of the conductors is due to the flow of negatively charged electrons. The direction of the conventional current is:

- a) From positive to the negative terminal of a battery.
- b) From negative to positive terminal of a battery.
- c) Alternating between two terminals of a battery.

10. Ohm's law is applicable as long as..... Of the conductor remains constant.

- a) Charge.
- b) Voltage.
- c) Current.
- d) Temperature.

11. The terminal potential difference of a battery becomes equal to its emf when its internal resistance is:

- a) Infinite.
- b) Very high.
- c) Very low.
- d) Zero.

12. At a constant temperature the resistivity of a conductor depends upon:

- a) It's length.
- b) It's area of cross section.
- c) It's material.
- d) It's volume.

13. At a given temperature the resistance of a conductor of uniform area of cross section is directly proportional to its length, because:

- a) Distance between atoms of the conductor becomes long.
- b) In a long conductor free electrons have to cover long distances, there by suffering more collisions with the atoms of the conductor.
- c) In a long conductor free electrons have to cover long distance.
- d) In a long conductor atoms vibrate through longer distances.

14. At a given temperature the resistance of a piece of wire of given length is inversely proportional to its area of cross section, because:

- a) Free electrons have plenty of space through which they can move, without colliding with the atoms of the wire.
- b) Atoms of the wire are less in number if the wire is thin.
- c) There are fewer collisions with free electrons if the wire is thin.
- d) There are more collisions between the atoms and free electrons of the wire if it is thick.

15. All electrical appliances are connected in parallel to each other, between the live and neutral lines, so that:

- a) Each appliance gets same current.
- b) Each appliance gets same potential difference.
- c) High power appliance gets high voltage.
- d) Low power appliance gets negligible current.

16. The S.I unit of resistance is "ohm", it is equivalent to:

- a) Volt/ampere.
- b) Coulomb/volt.
- c) Volt/coulomb.
- d) Ampere/volt.

17. S.I. unit resistivity is:

- a) Ohm.
- b) Ohm/m.
- c) Ohm-m².
- d) Ohm – m.

18. The change in resistance per unit resistance per degree centigrade change in its temperature is called:

- a) Resistivity.
- b) Temperature coefficient of resistance.
- c) Resistance at a given temperature.
- d) None of the above.

19. Temperature coefficient of resistance of a conductor depends upon:

- a) It's length.
- b) It's area of cross section.
- c) It's temperature.
- d) It's material.

20. Standard resistances are made of those materials whose temperature coefficient is:

- a) High.
- b) Very high.
- c) Small.
- d) Very small.

21. Elements of heaters, pressing iron, immersion heater etc. are usually made of a material which can withstand a high temperatures and whose resistivity is:

- a) High.
- b) Very high.
- c) Small.
- d) Very small.

22. Resistance of conductors usually increases with a rise in its temperature, because:

- a) Conductors expand on heating.
- b) Amplitude of vibration increases, resulting in more collisions.
- c) Amplitude as well as K.E. of atoms increases, resulting in more collisions.
- d) Distance between atoms increases, so the free electrons have to cover longer distance.

23. The value of resistivity depends upon:

- a) Length.
- b) Area of cross section.
- c) Temperature and material.
- d) None of the above.

24. Domestic appliances (such as radio, T.V. bulbs, refrigerators, A.C. etc.) are connected:

- a) In parallel to each other.
- b) In Series to each other.
- c) High power appliances in series and low power in parallel to each other.
- d) Low power appliances in series and high power in parallel to each other.

25. A battery of 12 volt is connected across the series combination of three resistors each of 5Ω resistance. The current flowing through each resistor is:

- a) 2.4 ampere.
- b) 1.25 ampere.
- c) 0.8 ampere.
- d) 0.42 ampere.

26. KWh is the unit of:

- a) Power.
- b) Energy.
- c) Both power and energy.
- d) Neither power nor energy.

27. When a battery is connected across a circuit, the circuit draws some current from it, under this condition the potential difference across its terminals is less than it's e.g. because:

- a) The electrolyte of the battery offers some resistance.
- b) On delivering some current to the circuit the battery becomes weaker.
- c) Potential difference and e.m.f are two different quantities.
- d) There is some potential drop across the internal resistance.

28. The electromotive force of a source is:

- a) The amount of energy dissipated as heat when current is passed through a resistor.
- b) The force required to move a charge round a closed circuit.
- c) The amount of work done to move one coulomb charge round a closed circuit.
- d) The amount of work done to move one coulomb charge from positive to negative terminal of a source.

29. When two or more resistors are connected in parallel, the total resistance of the combination is:

- a) Less than the less individual value of resistance in the combination.
- b) Less than the highest individual value of resistance in the combination.
- c) Higher than the highest individual value of resistance in the combination.
- d) Higher than the least individual value of resistance in the combination.

30. in parallel combination of resistors of different resistances:

- a) Potential difference across each resistor is same.
- b) Different current flows through different resistors.
- c) Reciprocal of net resistance of the combination is the sum of reciprocal of individual resistances.
- d) All of them.

31. in series combination of resistors of different resistances:

- a) Potential difference across each resistor is different.
- b) Same current flows through different resistors.
- c) Net resistance of the combination is the sum of individual resistances.
- d) All of them.

32. The S.I unit of electromotive force is:

- a) Newton.
- b) Dyne.
- c) Coulomb.
- d) Volt.

33. Resistors of $3\ \Omega$ and $5\ \Omega$ resistances are connected in series, and a potential difference of 10 volts is applied across their combination. Current flowing through $3\ \Omega$ resistors will be:
- 5.33 ampere.
 - 3.33 ampere.
 - 1.66 ampere.
 - 1.25 ampere.
34. Resistors of $3\ \Omega$ and $5\ \Omega$ resistances are connected in parallel, and a potential difference of 10 volts is applied across their combination. Current flowing through $3\ \Omega$ resistors will be:
- 3.33 ampere.
 - 2.0 ampere.
 - 1.66 ampere.
 - 1.25 ampere.
35. To increase the resistance of a conductor of a given material at a given temperature:
- Its length and thickness must be increased.
 - Its length and thickness must be decreased.
 - Its length must be increased and thickness (area of cross section) must be decreased.
 - Its length must be decreased and thickness (area of cross section) must be increased.
36. In an external circuit conventionally current flows from positive to negative terminal, same (equal) current from negative to positive terminal through the source, while flowing through the source (such as a battery) charges come across an opposition (resistance) due collisions with atoms of the electrolyte and terminals of source. The opposition to the flow of current through the source is called:
- Terminal resistance.
 - Electrolytic resistance.
 - Oh resistance.
 - Internal resistance
37. Two resistors of $3\ \Omega$ and $5\ \Omega$ resistance are connected in parallel to each other. A potential difference of 8 volt is applied across the combination. The potential difference across $5\ \Omega$ resistors is:
- 1 volt.
 - 1.66 volt.
 - 2.66 volt.
 - 8 volt.
38. Two resistors of $3\ \Omega$ and $5\ \Omega$ resistance are connected in parallel to each other. A potential difference of 10 volt is applied across the combination. The current flowing through $5\ \Omega$ resistors is:
- 0.2 ampere.
 - 1.25 ampere.
 - 2 ampere.
 - 2.5 ampere.

39. Two resistors of $3\ \Omega$ and $5\ \Omega$ resistances are connected in parallel to each other. The resistance of the equivalent resistor is:
- 0.533 Ohm.
 - 1.875 Ohm.
 - 2.5 Ohm.
 - 3.5 Ohm.
40. Two resistors of $3\ \Omega$ and $5\ \Omega$ resistance are connected in series to each other. A potential difference of 8 volt is applied across the combination. The potential difference across $5\ \Omega$ resistors is:
- 3 volt.
 - 4 volt.
 - 5 volt.
 - 6 volt.
41. Two resistors of $3\ \Omega$ and $5\ \Omega$ resistance are connected in series to each other. A potential difference of 10 volt is applied across the combination. The current flowing through $5\ \Omega$ resistors is:
- 1.25 ampere.
 - 5.33 ampere.
 - 6.5 ampere.
 - 18.75 ampere.
42. Two resistors of $3\ \Omega$ and $5\ \Omega$ resistance are connected in series to each other. The resistance of the equivalent resistor is:
- 8 Ohm.
 - 2.33 Ohm.
 - 0.533 Ohm.
 - 1.875 Ohm.
43. Choose the correct statement:
- Positive charges move in conductors from point of higher to point at lower potential.
 - Negative charges move in conductors from points at higher to points at lower potential.
 - Positive charges move in conductors from point of lower to point at higher potential.
 - Negative charges move do not move.
44. A hollow charged sphere produces an electric field at:
- Any interior point.
 - Any exterior point.
 - The center of the sphere.
 - The surface of the sphere.

45. The capacitance of a parallel plate capacitor does not depend on:

- a) Area of the plates.
- b) Separation of the plates.
- c) Medium between the plates.
- d) Material of which the plates are made.

46. If E and V represent electric intensity and electric potential of a field at any point. Choose the correct statement.

- a) If $E = 0$ then V can be constant.
- b) If $E = 0$ then V can be zero.
- c) If $E = 0$ then V must be zero.
- d) If $V = 0$ then E must be zero.

47. A parallel plate capacitor with air between its plates is charged, the voltage source is then disconnected. Let charge stored is Q , potential difference is V and E is the electric field between its plates. A dielectric is then introduced between its plates, the new quantities are Q' , V' and E' respectively, the relation between different quantities is:

- a) $Q' = Q$
- b) $E' > E$
- c) $V' > V$

48. Temperature coefficient of resistance of semiconductor is:

- a) Positive.
- b) Negative.
- c) Zero.
- d) Can be positive or negative depending upon material.

49. The power dissipated in a resistance is: (6a I, 05)

- a) $V I$.
- b) $I^2 R$
- c) V^2/R
- d) All of these.

50. The commercial unit of electrical energy is:

- a) Chm.
- b) Watt.
- c) Kilowatt-hour.
- d) Ampere.

51. The electrical energy dissipated as heat in a resistor is given by: (1 – IV, 2010)

- a) $I^2 R$
- b) $I^2 R t$
- c) $V^2 R$
- d) $V^2 R t$.

ANSWERS

- (24) Remains the same.
- (25) Rate of follow of charges through a cross section of the conductor.
- (26) Ampere.
- (27) D.C. Only.
- (28) V1.
- (29) Chemical energy.
- (30) Coulomb/second.
- (31) Mechanical energy.
- (32) From positive to the negative terminal of a battery.
- (33) Temperature.
- (34) Zero.
- (35) It's material.
- (36) In a long conductor free electrons have to cover long distances, there by suffering more collisions with the atoms of the conductor.
- (37) Free electrons have plenty of space through which they can move, without colliding with the atoms of the wire.
- (38) Each appliance gets same potential difference.
- (39) Volt/ampere.
- (40) Ohm – m.
- (41) Temperature coefficient of resistance.
- (42) It's material.
- (43) Very small.
- (44) Very high.
- (45) Amplitude as well as K.E of atoms increases, resulting in more collisions.
- (46) Temperature and material.
- (47) In parallel to each other.
- (48) 0.8 ampere.
- (49) Energy.
- (50) There is some potential drop across the internal resistance.
- (51) The amount of work done to move one coulomb charge from positive to negative terminal of a source.
- (1) Less than the least individual value of resistance in the combination.
- (2) All of them.
- (3) All of them.
- (4) Volt.
- (5) 1.25 ampere.
- (6) 3.33 ampere.
- (7) Its length must be increased and thickness (area of cross section) must be decreased.
- (8) Internal resistance.
- (9) 8 volt.
- (10) 8 volt.
- (11) 1.875 Ohm.
- (12) 5 volt.
- (13) 1.25 ampere.
- (14) 8 Ohm.
- (15) Positive charges move in conductors from point of higher to point at lower potential.
- (16) Any exterior point.
- (17) Material of which the plates are made.
- (18) If $E = 0$ then V can be constant.
- (19) $Q' = Q$
- (20) Negative.
- (21) All of these.
- (22) Kilowatt-hour.
- (23) $1^2 R t$.

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