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## Electrical Measuring Instruments

## Chapter No.15 (MCQs)



1. A galvanometer is an electromechanical device, it concerts:
   a) Mechanical energy into electrical energy.
   b) Electrical energy into mechanical energy.
   c) Elastic energy into electrical energy.
   d) Electromagnetic energy into mechanical energy.
2. Principle of working of a galvanometer is that:
   a) A current carrying coil experiences attractive force in a magnetic field.
   b) A current carrying coil experiences repulsive force in a magnetic field.
   c) A current carrying coil experiences torque in a magnetic field.
   d) None of these.
3. In a moving coil galvanometer poles of the magnet are made concave shaped due to which:
   a) Magnetic field is strong and uniform.
   b) Magnetic field is strong and radial.
   c) Magnetic field is weak and uniform.
   d) Magnetic field is weak and radial.
4. For a radial magnetic field the angle $\alpha$ between the plane of coil and the magnetic field is:
   a) $0^o$
   b) $30^o$
   c) $60^o$
   d) $90^o$
5. Sensitivity of a galvanometer can be increased by:
   a) Increasing the number of turns and area of the coil.
   b) Using a strong magnet.
   c) Decreasing couple per unit twist of the suspension wire.
   d) All of these.
6. A galvanometer can be converted into an ammeter.
   a) By connecting a low resistance in series to its coil.
   b) By connecting a low resistance in parallel to its coil.
   c) By connecting a high resistance in series to its coil.
   d) By connecting a high resistance in parallel to its coil.
7. In order to measure current with maximum accuracy. The resistance of the ammeter must be:
   a) High.
   b) Very high.
   c) Low.
   d) Very low.
8. If $R_g$ is the shunt resistance, then the resistance of an ammeter is given by:
   a) $R_A = R_g + R_S$
   b) $R_A = 1/R_g + 1/R_S$
   c) $1/R_A = 1/R_g + 1/R_S$
   d) $1/R_A = 1/R_g - 1/R_S$
9. An ammeter is connected:
   a) In parallel to the circuit.
   b) In series to the circuit.
   c) Sometimes min series some times in parallel to the circuit.
10. Ammeter is used to measure:
   a) Charge.
   b) Current.
   c) Potential difference.
   d) Emf.
11. Voltmeter is used to measure:
   a) Charge.
   b) Current.
   c) Potential difference.
   d) Resistance.
12. A galvanometer can be converted into a voltmeter by connecting:
   a) A low resistance in series to its coil.
   b) A low resistance in parallel to its coil.
   c) A high resistance in series to its coil.
   d) A high resistance in parallel to its coil.

13. A voltmeter is connected:

a) In parallel to the circuit.
b) In series to the circuit.
c) Some times in series some times in parallel to the circuit.

14. For accurate measurement of potential difference the resistance of the voltmeter must be:

a) High.
b) Very high.
c) Low.
d) Very low.

15. If $R_g$ is the resistance of coil of a galvanometer, $R_X$ is the value of series resistor, and then the resistance $R_V$ of a voltmeter is given by:

a) $R_V = R_g + R_X$.
b) $R_V = 1/R_g + 1/R_X$.
c) $1/R_V = 1/R_g + 1/R_X$.
d) $1/R_V = 1/R_g - 1/R_X$.

16. The value of shunt resistance $R_s$ required converting a galvanometer of resistance $R_g$ into an ammeter of range "I" can be calculated by:

a) $R_S = I_g R_g / (I - I_g)$
b) $1/R_s = I_g R_g / (I - I_g)$
c) $R_S = (I - I_g) / I_g R_g$
d) $1/R_S = (I - I_g) / I_g R_g$

17. The value of series resistance $R_x$ required to convert a galvanometer of resistance $R_g$ into a voltmeter of range "V" can be calculated by:

a) $R_x = I_g R_g /(I - I_g)$
b) $R_x = V/I_g - R_g$
c) $R_x = V/R_g - I_g$
d) $R_x = I_g R_g - V / (I - I_g)$

18. When a Wheatstone bridge of resistance arms $R_1$, R2, R3 and $R_4$ is balanced:

a) No current flows through the galvanometer.
b) No current flows through its arms.
c) Some current flows through the galvanometer.
d) There is no potential difference across the galvanometer.

19. Meter Bridge is based on:

a) Circuital law.
b) Coulomb's law.
c) Wheatstone bridge principle.
d) Ampere's law.

20. If the resistance of a galvanometer is 50 Ω the resistance of ammeter having a 0.1Ω shunt will be:

a) 50.1Ω.
b) 5.01Ω.
c) 0.501Ω.
d) 0.01Ω.

21. If the resistance of a galvanometer is 50Ω the resistance of voltmeter having a 5000Ω series resistance will be:

a) 5050Ω.
b) 500.01Ω.
c) 0.501Ω.
d) 0.01Ω.

22. To increase the accuracy in a potentiometer circuit: (5-a, 1997, 99)

a) A wire of small length should be used.
b) A wire of large length should be used.
c) A non uniform wire is used.

23. All the electrical appliances are connected in parallel to each other between the main line and the neutral wire to get:

a) The same current.
b) The same potential difference.
c) Different current and the same potential difference.
d) None of the above.

24. A galvanometer can be used to measure current by connecting:

a) Low resistance in series.
b) High resistance in series.
c) Low resistance in parallel.
d) High resistance in parallel.

25. A galvanometer can be converted into an ammeter by connecting: (6-a, 2002, P.E)

a) Low resistance in series.
b) High resistance in series.
c) Low resistance in parallel.
d) High resistance in parallel.

26. Potentiometer is a device for measuring: (4-a, 2003 PM)

a) Potential difference between the two points of a circuit. (4-a, 2003 PM)
b) Voltage between the two points of a circuit.
c) E.M.F of a current source.
d) All of them.

27. Total potential difference across the combination of three cells becomes maximum when (4-a, 2003 PM)

a) All of the three cells are connected in series.
b) All of the three cells are connected in parallel.
c) Two cells are connected in parallel and the third cell in series with the combination.
d) Two cells are connected in series and the third cell in parallel with the combination.

28. A meter bridge is used to measure: (6-a, 2002, P.E)

a) Voltage.
b) Inductance.
c) Capacitance.
d) Resistance.

29. AVO meter is used to measure: (5-a, 2002, P.E)

a) Current.
b) Voltage.
c) Resistance.
d) All of them.

30. AA single device containing ammeter, voltmeter and ohmmeter is called: (1-vi, 2010)

a) VTVM.
b) CRO.
c) Potentiometer.
d) Multi-meter.

# ANSWERS

(1) Electrical energy into mechanical energy.
(2) A current carrying coil experiences torque in a magnetic field.
(3) Magnetic field is strong and radial.
(4) $0^{o}$.
(5) All of these.
(6) By connecting a low resistance in parallel to its coil.
(7) Very low.
(8) $1/R_A = 1/R_g + 1/R_S$.
(9) In series to the circuit.
(10) Current.
(11) Potential difference.
(12) A high resistance in series to its coil.
(13) In parallel to the circuit.
(14) Very high.
(15) $R_V = R_g + R_x$.
(16) $R_S = I_g R_g / (I - I_{-g})$
(17) $R_x = V/I_{-g} - R_g$.
(18) No current flows through the galvanometer.
(19) Wheatstone bridge principle.
(20) 0.01Ω.
(21) 5050Ω.
(22) A wire of large length should be used.
(23) Different current and the same potential difference.
(24) Low resistance in parallel.
(25) Low resistance in parallel.
(26) All of them.
(27) All of the three cells are connected in series.
(28) Resistance.
(29) All of them.
(30) Multi-meter.