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Daily Practice Problems

NEET PHYSICS

Topic: Electrical instrument.

Q.1 A galvanometer gives a full deflection when a current of 0.2 mA is passed through it. The resistance of the galvanometer is 1000 Ω. To convert it to an ammeter of range 2 amp, the shunt resistance required is –

(A) 0.1 Ω (B) 0.01 Ω

(C) 1 Ω (D) 0.2 Ω

Q.2 A galvanometer of resistance 100 Ω gives a full scale deflection for a current to 10^{-6} amp. To convert it into an ammeter capable of measuring up to one ampere, the shunt resistance should be–

(A) 10^{-5} Ω (B) 0.001 Ω

(C) 0.01 Ω (D) 1 Ω

Q.3 If the positions of an ideal voltmeter and the ammeter are interchanged in a D.C. circuit, then-

(A) the voltmeter reads the emf of the source and the ammeter reading is zero

(B) the voltmeter reads the emf of the source and the ammeter shows of maximum current

(C) the voltmeter reading is zero and the ammeter reading is also zero

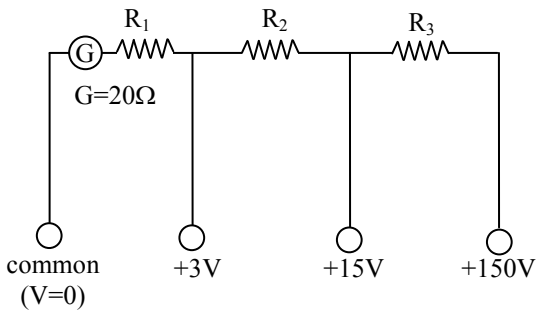
(D) voltmeter reading is zero and the ammeter current is infinite

Q.4 A galvanometer is used in circuit of 9 volt. The value of current for full scale deflection is 2 mA if the resistance of the coil is 50Ω, then the value of necessary resistance in series for the full scale deflection in ohm is -

(A) 2450 (B) 3450

(C) 4450 (D) 5450

Q.5 Internal electric connections of a multi range voltmeter are shown in the figure. The terminals are marked 3 volt, 15 volt, 150 volt, resistance of the galvanometer is 20 Ω and the value of current is 1 mA for the full scale deflection of the galvanometer. The resistance of R_1 in KΩ is-



(A) 12 (B) 15

(C) 3 (D) 2.98

Q.6 The resistance of galvanometer coil is 0.1 KΩ. The current for full scale deflection is 100 μA. The value of the resistance put in series to convert it into a voltmeter of range 0.1 volt is-

(A) 1000 Ω (B) 100 Ω

(C) 10 Ω (D) 900 Ω

Q.7 The resistance of 100Ω and 200Ω are connected in series with the 220 V mains. When a voltmeter of 1000 Ω resistance is connected in parallel to 100 Ω, then the reading of voltmeter is –

(A) 68.75 volt (B) 6.87 volt

(C) 587.5 volt (D) 58.75 volt

Q.8 If only one hundredth part of total current flowing in the circuit is to be passed through a galvanometer of resistance G Ω, then the value of shunt resistance required will be -

(A) $\frac{G}{10}$ (B) $\frac{G}{100}$

(C) $\frac{G}{99}$ (D) $\frac{G}{999}$

Q.9 The shunt required for 10% of main current to be sent through the moving coil galvanometer of resistance 99 Ω, will be -

(A) 0.9 Ω (B) 11 Ω

(C) 90 Ω (D) 9.9 Ω

Q.10 A galvanometer of resistance 100 Ω gives full scale deflection for 10 mA current. What should be the shunt required, so that it can measure 100 mA -

(A) 11.11 Ω (B) 9.9 Ω

(C) 1.1 Ω (D) 4.4 Ω

Q.11 A galvanometer of resistance 100Ω gives full scale deflection for a current of 10^{-5} A. The shunt required to convert it into an ammeter of 1 ampere range will be -

(A) $10^{-2}\,\Omega$ (B) $1\,\Omega$

(C) $10^{-1}\,\Omega$ (D) $10^{-3}\,\Omega$

Q.12 A galvanometer of resistance 100 ohm gives a full scale deflection for a current of 10μA.

To convert in into an ammeter of one ampere range, required shunt resistance would be -

(A) $10^{-2}\,\Omega$ (B) $1\,\Omega$

(C) $10^{-1}\,\Omega$ (D) $10^{-3}\,\Omega$

Q.13 The deflection in the galvanometer is reduced from 50 to 20 divisions

when it is shunted by a resistance of 12 ohm. The resistance of galvanometer will be -

(A) 18 Ω (B) 24 Ω

(C) 30 Ω (D) 36 Ω

Q.14 The resistance of a moving coil galvanometer is 20 Ω. If requires 0.01 ampere current for full scale deflection. The value of resistance to convert it into a voltmeter of range 20 volt will be -

(A) 198 Ω (B) 1980 Ω

(C) 20 Ω (D) 0 Ω

Q.15 The range of a voltmeter of resistance G Ω is V volt.
The resistance required to be connected in series with it in order to convert it into a voltmeter of range nV volt, will be -

(A) (n – 1) G (B) G/n

(C) nG (D) G/(n – 1)

Q.16 The deflection of a moving coil galvanometer reduces to half on shunting it with a resistance of 60Ω. The resistance of galvanometer is -

(A) 30 Ω (B) 120 Ω

(C) 60 Ω (D) 15 Ω

Q.17 When the current flowing in a galvanometer is (1/n) of the total current, the resistance of the shunt will be -

(A) G/n (B) (n – 1) G

(C) G / (n –1) (D) $G/(n^2 - 1)$

Q.18 A galvanometer can be converted into a voltmeter by connecting a –

(A) high resistance in parallel

(B) low resistance in series

(C) high resistance in series

(D) low resistance in parallel

Q.19 Potentiometer is such an apparatus whose effective resistance is -

(A) zero

(B) infinite

(C) uncertain

(D) depending on external resistance

Q.20 In every experiment with potentiometer in the null point state, the potential difference between the ends of the galvanometer is -

(A) zero

(B) infinite

(C) equal to the p.d. of the cell

(D) unknown

Q.21 The specific resistance per unit area of cross section of a wire is equivalent to -

(A) charge/current (B) resistance/length

(C) potential gradient (D) current/area

Q.22 If the length of the potentiometer wire is doubled, the sensitivity for obtaining null point will -

(A) increase
(B) remain unchanged
(C) decrease
(D) uncertain

Q.23 The potential gradient of the potentiometer wire depends on -

(A) only on the current that flows
(B) only the resistance per unit length of the wire
(C) both the above mentioned
(D) none of the above

Q.24 The potentiometer wire is replaced by another wire whose length thickness and specific resistance are double the previous one. The current strength flowing through it is also doubled. How many times will the potential gradient becomes ?

(A) 1 (B) 2 (C) 4 (D) 8

Q.25 If the current in a potentiometer increases, the position of the null point will -

(A) be obtained at a larger then the previous one

(B) be equal to the previous length

(C) be obtained at a smaller length than the previous

(D) none of the above

Q.26 A battery of negligible internal resistance is connected to the ends of a potentiometer wire. The potential gradient can be changed by (r = R' = 0 for wire) -

(A) increasing the length of wire

(B) increasing the thickness of wire

(C) changing the direction of the current

(D) increasing its resistance

Q.27 The length of a potentiometer wire is 10 m and a p.d. of 2 volt is applied to its ends. If the length of its wire is increased by 1 m, the value of potential gradient in volt/m will be -

(A) 0.18 (B) 0.22

(C) 1.3 (D) 0.9

Q.28 If the specific resistance of a potentiometer is (ρ) area of cross-section is A, and the current flowing in the wire is (I) then the potential gradient is -

(A) $IA\rho$ (B) IA/ρ

(C) $I\rho/A$ (D) ρ/IA

Q.29 The potentiometer is an ideal apparatus for measuring potential differences because -

(A) it's resistance is low

(B) at null position its resistance is zero

(C) it's range is adjustable

(D) it does not draw any current when measuring p.d.

Q.30 A potentiometer is based on the principle -

(A) of wheatstone bridge

(B) that the fall of potential along a wire is proportional to its lengths

(C) that the resistance of potentiometer wire is large

(D) of post office box

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	B	A	B	B	C	B	B	A	D	D
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	B	A	A	C	B	B	A	C	A	C
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	B	C	C	A	C	B	D	D	A	D