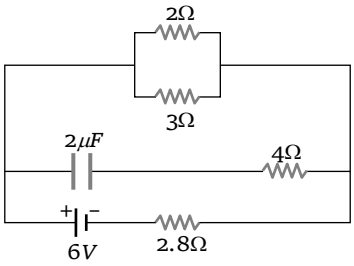
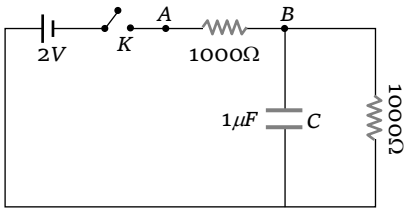
1. In the figure shown, the capacity of the condenser C is $2\mu F$. The current in 2Ω resistor is **[IIT 1982]**



(a) $9\ A$ (b) $0.9\ A$

(c) $\frac{1}{9}A$ (d) $\frac{1}{0.9}A$

2. When the key K is pressed at time $t = 0$, which of the following statements about the current I in the resistor AB of the given circuit is true **[CBSE PMT 1995]**



(a) I = 2 mA at all t

(b) I oscillates between 1 mA and 2mA

(c) I = 1 mA at all t

(d) At t = 0 , I = 2 mA and with time it goes to 1 mA

3. Two cells of equal *e.m.f.* and of internal resistances r_1 and $r_2(r_1 > r_2)$ are connected in series. On connecting this combination to an external resistance R, it is observed that the potential difference across the first cell becomes zero. The value of R will be

[MP PET 1985; KCET 2005; Kerala PMT 2005]

(a) $r_1 + r_2$ (b) $r_1 - r_2$

(c) $\frac{r_1 + r_2}{2}$ (d) $\frac{r_1 - r_2}{2}$

4. When connected across the terminals of a cell, a voltmeter measures 5*V* and a connected ammeter measures 10 *A* of current. A resistance of 2 *ohm*s is connected across the terminals of the cell. The current flowing through this resistance will be **[MP PMT 1997]**

(a) 2.5 *A* (b) 2.0 *A*

(c) 5.0 *A* (d) 7.5 *A*

5. A microammeter has a resistance of $100\,\Omega$ and full scale range of $50\,\mu A$. It can be used as a voltmeter or as a higher range ammeter provided a resistance is added to it. Pick the correct range and resistance combination

[SCRA 1996; AMU (Med.) 2001; Roorkee 2000]

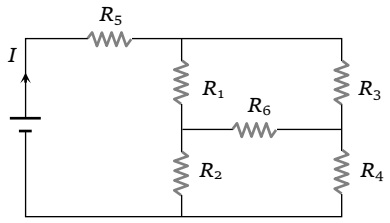
(a) 50 *V* range with $10\,k\Omega$ resistance in series

(b) 10 *V* range with $200\,k\Omega$ resistance in series

(c) 10 *mA* range with 1Ω resistance in parallel

(d) 10 *mA* range with 0.1Ω resistance in parallel

6. In the given circuit, it is observed that the current I is independent of the value of the resistance R_6. Then the resistance values must satisfy **[IIT-JEE (Screening) 2001]**



(a) $R_1R_2R_5 = R_3R_4R_6$

(b) $\frac{1}{R_5}+\frac{1}{R_6} = \frac{1}{R_1+R_2}+\frac{1}{R_3+R_4}$

(c) $R_1R_4 = R_2R_3$

(d) $R_1R_3 = R_2R_4 = R_5R_6$

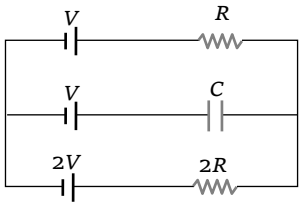
7. In the given circuit, with steady current, the potential drop across the capacitor must be **[IIT-JEE (Screening) 2001]**

(a) V

(b) $V / 2$

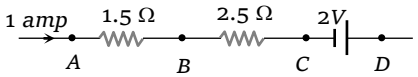
(c) $V / 3$

(d) $2V / 3$



8. In the circuit element given here, if the potential at point B, V_B = 0, then the potentials of A and D are given as

[AMU (Med.) 2002]

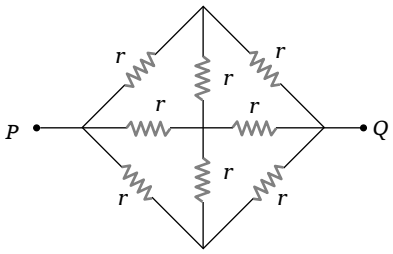


(a) $V_A = -1.5\,V, V_D = +2\,V$ (b) $V_A = +1.5\,V, V_D = +2\,V$

(c) $V_A = +1.5\,V, V_D = +0.5\,V$ (d) $V_A = +1.5\,V, V_D = -0.5\,V$

9. The equivalent resistance between the points P and Q in the network given here is equal to (given $r = \frac{3}{2}\Omega$)

[AMU (Med.) 2002]



(a) $\frac{1}{2}\ \Omega$

(b) $1\ \Omega$

(c) $\frac{3}{2}\ \Omega$

(d) $2\ \Omega$

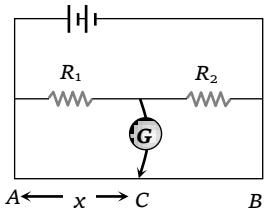
10. In the shown arrangement of the experiment of the meter bridge if AC corresponding to null deflection of galvanometer is x, what would be its value if the radius of the wire AB is doubled **[IIT-JEE (Screening) 2003]**

(a) x

(b) $x/4$

(c) $4x$

(d) $2x$

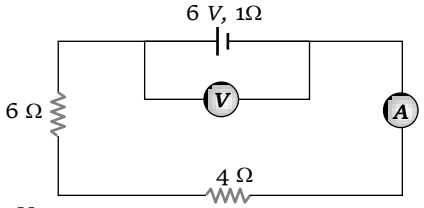


11. The resistance of a wire of iron is 10 *ohms* and temp. coefficient of resistivity is $5\times10^{-3}/°C$. At $20°C$ it carries 30 *milliamperes* of current. Keeping constant potential difference between its ends, the temperature of the wire is raised to $120°C$. The current in *milliamperes* that flows in the wire is **[MP PMT 1994]**

(a) 20 (b) 15

(c) 10 (d) 40

12. In the circuit shown here, the readings of the ammeter and voltmeter are **[Kerala PMT 2002]**



(a) 6 *A*, 60 *V*

(b) 0.6 *A*, 6 *V*

(c) 6/11 *A*, 60/11 *V*

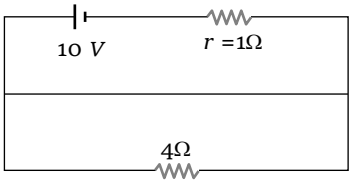
(d) 11/6 *A*, 11/60 *V*

13. Length of a hollow tube is $5m$, it's outer diameter is 10 cm and thickness of it's wall is 5 mm. If resistivity of the material of the tube is $1.7 \times 10^{-8}\ \Omega \times m$ then resistance of tube will be

(a) $5.6 \times 10^{-5}\ \Omega$ (b) $2 \times 10^{-5}\ \Omega$

(c) $4 \times 10^{-5}\ \Omega$ (d) None of these

14. Potential difference across the terminals of the battery shown in figure is (r = internal resistance of battery)



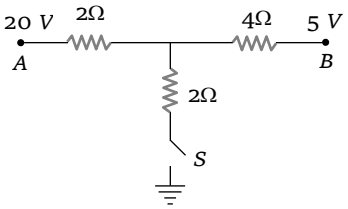
(a) 8 V

(b) 10 V

(c) 6 V

(d) Zero

15. As the switch S is closed in the circuit shown in figure, current passed through it is



(a) 4.5 A

(b) 6.0 A

(c) 3.0 A

(d) Zero

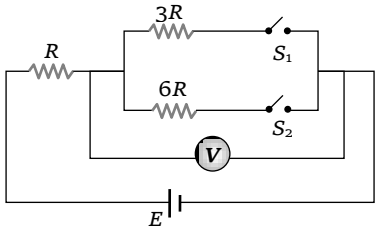
16. In the circuit shown in figure reading of voltmeter is V_1 when only S_1 is closed, reading of voltmeter is V_2 when only S_2 is closed and reading of voltmeter is V_3 when both S_1 and S_2 are closed. Then

(a) $V_3 > V_2 > V_1$

(b) $V_2 > V_1 > V_3$

(c) $V_3 > V_1 > V_2$

(d) $V_1 > V_2 > V_3$



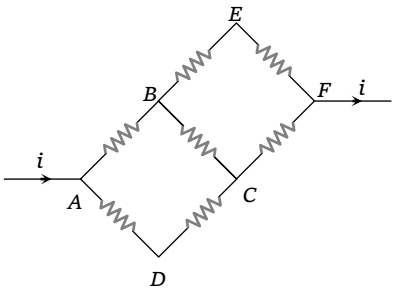
17. In the adjoining circuit diagram each resistance is of 10 Ω. The current in the arm AD will be

(a) $\frac{2i}{5}$

(b) $\frac{3i}{5}$

(c) $\frac{4i}{5}$

(d) $\frac{i}{5}$



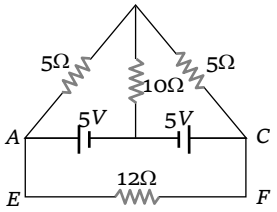
18. In the circuit of adjoining figure the current through 12 Ω resister will be

(a) 1 A

(b) $\frac{1}{5}A$

(c) $\frac{2}{5}A$

(d) 0 A



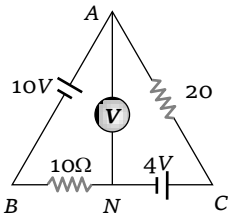
19. The reading of the ideal voltmeter in the adjoining diagram will be

(a) 4 *V*

(b) 8 *V*

(c) 12 *V*

(d) 14 *V*



20. The resistance of the series combination of two resistance is S. When they are joined in parallel the total resistance is P. If $S = nP$, then the minimum possible value of n is

[AIEEE 2004]

(a) 4 (b) 3

(c) 2 (d) 1

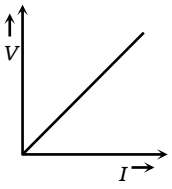
21. A moving coil galvanometer has 150 equal divisions. Its current sensitivity is 10 *divisions per milliampere* and voltage sensitivity is 2 *divisions per millivolt*. In order that each division reads 1 *volt*, the resistance in ohms needed to be connected in series with the coil will be **[AIEEE 2005]**

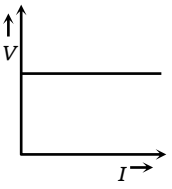
(a) 99995 (b) 9995

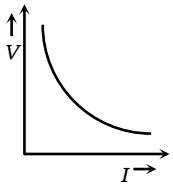
(c) 10^3 (d) 10^5

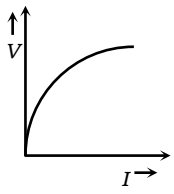
22. Which of the adjoining graphs represents *ohm*ic resistance

[CPMT 1981; DPMT 2002]

(a) 

(b) 

(c) 

(d) 

23. The voltage V and current I graph for a conductor at two different temperatures T_1 and T_2 are shown in the figure. The relation between T_1 and T_2 is

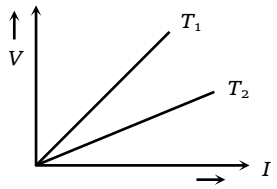
[MP PET 1996; KCET 2002]

(a) $T_1 > T_2$

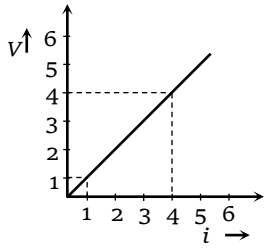
(b) $T_1 \approx T_2$

(c) $T_1 = T_2$

(d) $T_1 < T_2$



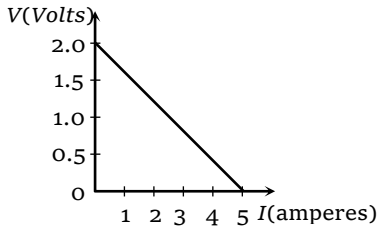
24. Variation of current and voltage in a conductor has been shown in the diagram below. The resistance of the conductor is.



(a) 4 *ohm* (b) 2 *ohm*

(c) 3 *ohm* (d) 1 *ohm*

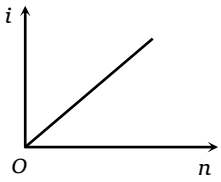
25. For a cell, the graph between the potential difference (V) across the terminals of the cell and the current (I) drawn from the cell is shown in the figure. The e.m.f. and the internal resistance of the cell are

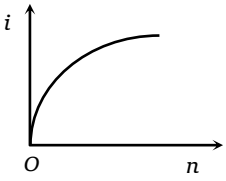


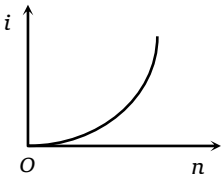
(a) $2V, 0.5\Omega$ (b) $2V, 0.4\Omega$

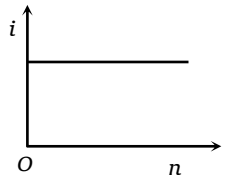
(c) $> 2V, 0.5\Omega$ (d) $> 2V, 0.4\Omega$

26. A battery consists of a variable number 'n' of identical cells having internal resistances connected in series. The terminals of battery are short circuited and the current i is measured. Which of the graph below shows the relation ship between i and n

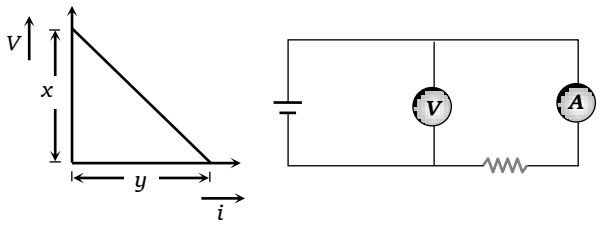
(a) 

(b) 

(c) 

(d) 

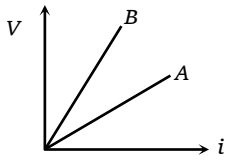
27. In an experiment, a graph was plotted of the potential difference V between the terminals of a cell against the circuit current i by varying load rheostat. Internal conductance of the cell is given by



(a) xy (b) $\frac{y}{x}$

(c) $\frac{x}{y}$ (d) $(x - y)$

28. *V-i* graphs for parallel and series combination of two identical resistors are as shown in figure. Which graph represents parallel combination

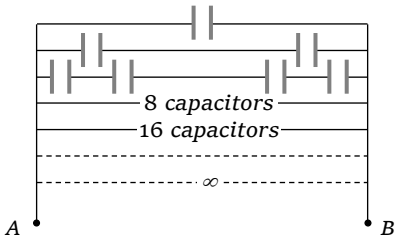


(a) *A* (b) *B*

(c) *A* and *B* both (d) Neither *A* nor *B*

29. An infinite number of identical capacitors each of capacitance $1\mu F$ are connected as in adjoining figure. Then the equivalent capacitance between A and B is

[EAMCET 1990]



(a) $1\mu F$

(b) $2\mu F$

(c) $\frac{1}{2}\mu F$

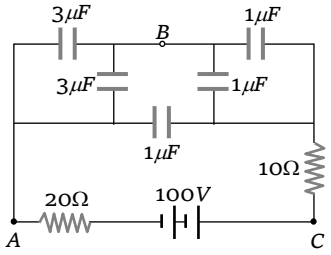
(d) ∞

30. Two condensers of capacities $2C$ and C are joined in parallel and charged upto potential V. The battery is removed and the condenser of capacity C is filled completely with a medium of dielectric constant K. The p.d. across the capacitors will now be **[IIT 1988]**

(a) $\frac{3V}{K+2}$ (b) $\frac{3V}{K}$

(c) $\frac{V}{K+2}$ (d) $\frac{V}{K}$

31. In the figure below, what is the potential difference between the point A and B and between B and C respectively in steady state **[IIT 1979]**



(a) $V_{AB} = V_{BC} = 100\ V$ (b) $V_{AB} = 75\ V, V_{BC} = 25\ V$

(c) $V_{AB} = 25\ V, V_{BC} = 75\ V$ (d) $V_{AB} = V_{BC} = 50\ V$

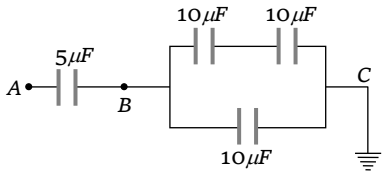
32. In the given circuit if point C is connected to the earth and a potential of $+2000\ V$ is given to the point A, the potential at B is **[MP PET 1997; Pb. PET 2003]**

(a) $1500\ V$

(b) $1000\ V$

(c) $500\ V$

(d) $400\ V$



33. A network of four capacitors of capacity equal to $C_1 = C, C_2 = 2C, C_3 = 3C$ and $C_4 = 4C$ are conducted in a battery as shown in the figure. The ratio of the charges on C_2 and C_4 is

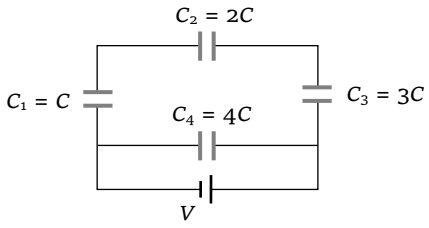
[CBSE PMT 2005]

(a) $\frac{22}{3}$

(b) $\frac{3}{22}$

(c) $\frac{7}{4}$

(d) $\frac{4}{7}$



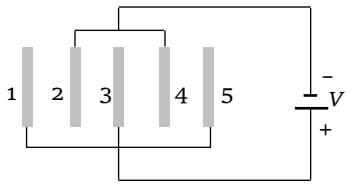
34. Five identical plates each of area A are joined as shown in the figure. The distance between the plates is *d*. The plates are connected to a potential difference of V *volts* . The charge on plates 1 and 4 will be **[IIT 1984]**

(a) $\frac{\varepsilon_0 AV}{d}.\frac{2\varepsilon_0 AV}{d}$

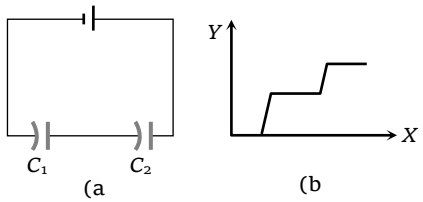
(b) $\frac{\varepsilon_0 AV}{d}.\frac{2\varepsilon_0 AV}{d}$

(c) $\frac{\varepsilon_0 AV}{d}.\frac{-2\varepsilon_0 AV}{d}$

(d) $\frac{-\varepsilon_0 AV}{d}.\frac{-2\varepsilon_0 AV}{d}$



35. Figure (a) shows two capacitors connected in series and joined to a battery. The graph in figure (b) shows the variation in potential as one moves from left to right on the branch containing the capacitors, if **[MP PMT 1999]**



(a (b

(a) $C_1 > C_2$

(b) $C_1 = C_2$

(c) $C_1 < C_2$

(d) The information is not sufficient to decide the relation between C_1 and C_2