# PHYSICS

21. An electric bulb is rated 220 V - 100 W. The power consumed by it when operated on 110 V will be
    (1) 50 W   (2) 75 W
    (3) 40 W   (4) 25 W

22. In a potentiometer experiment the balancing with a cell is at length 240 cm. On shunting the cell with a resistance of 2 Ω, the balancing length becomes 120 cm. The internal resistance of the cell is
    (1) 4 Ω (2) 2 Ω
    (3) 1 Ω (4) 0.5 Ω

23. A conducting wire of length l, area of cross-sectional A and electric resisitivity ρ is connected between the terminals of a battery. A potential difference V is developed between its ends, causing an electric current. If the length of the wire of the same material is doubled and the area of cross-section is halved, the resultant current would be
    (1) $4\dfrac{VA}{\rho l}$ (2) $\dfrac{3}{4}\dfrac{VA}{\rho l}$
    (3) $\dfrac{1}{4}\dfrac{\rho l}{VA}$ (4) $\dfrac{1}{4}\dfrac{VA}{\rho l}$

24. A 200 Ω resistor has a certain colour code. If one replaces the red colour by green in the code, the new resistance will be
    (1) 100 Ω (2) 400 Ω
    (3) 300 Ω (4) 500 Ω

25. Drift speed of electrons, when 1.5 A of current flows in a copper wire of cross section 5 mm^2, is v. If the electron density in copper is 9×10^{28} m^{-3} the value of v in mm s^{-1} close to (take charge of electron to be $= 1.6 \times 10^{-19}$ C)
    (1) 0.02   (2) 3
    (3) 2   (4) 0.2

26. In the given figure switches S_1 and S_2 are in open condition. The resistance across ab when the switches S_1 and S_2 are closed is _____ Ω.
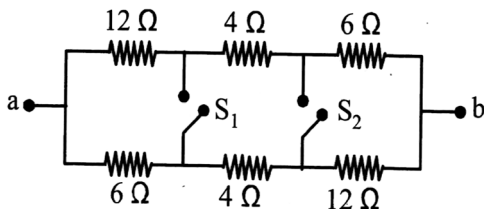
27. A cell of internal resistance r drives current through an external resistance R. The power delivered by the cell to the external resistance will be maximum when
    (1) R = 0.01r   (2) R = 100r
    (3) R = 2r   (4) R = r

28. In the given circuit shown, the potential difference between A and B is
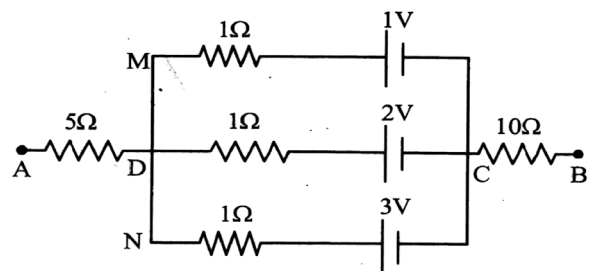
    (1) 1 V   (2) 2 V
    (3) 3 V   (4) 6 V

29. Two electric bulbs, rated at (25 W, 220 V) and (100 W, 220 V), are connected in series across a 220 V voltage source. If the 25 W and 100 W bulbs draw powers P_1 and P_2 respectively, then
    (1) $P_1 = 16$ W, $P_2 = 4$ W
    (2) $P_1 = 16$ W, $P_2 = 9$ W
    (3) $P_2 = 9$ W, $P_2 = 16$ W
    (4) $P_1 = 4$ W, $P_2 = 16$ W

30. Zener breakdown occurs in a p-n junction having p and n both
    (1) lightly doped and have wide depletion layer
    (2) heavily doped and have narrow depletion layer
    (3) lightly doped and have narrow depletion layer
    (4) heavily doped and have wide depletion layer

(1) 10   (2) 20
(3) 30   (4) 40