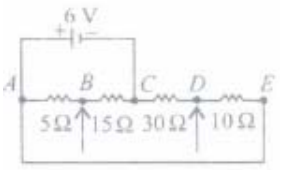
NEET PHYSICS PRACITCE PAPER

Time : 60 Mins **12 CURRENT ELECTRICITY 1** **Marks : 200**

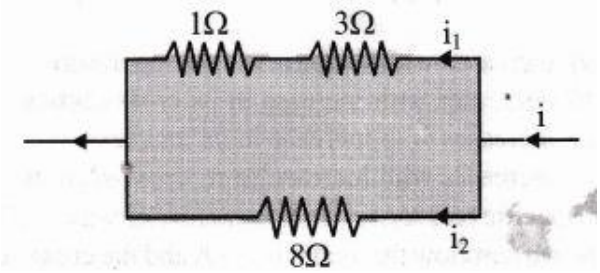
1. Four resistors are connected as shown in the figure. A 6 V battery of negligible resistance is connected across terminals A and C. The potential difference across terminals B and D will be



a) Zero b) 1.5V c) 2V d) 3V

2. A galvanometer of resistance 50 W is connected to battery of 3 V along with a resistance of 2950 W in series. A full scale deflection of 30 divisions is obtained in the galvanometer. In order to reduce this deflection to 20 divisions, the resistance in series should be _____.
   a) 5050 W b) 5550 W c) 6050 W d) 4450 W

3. Power dissipated across the 8W resistor in the circuit shown here is 2 watt. The power dissipated in watt units across the 3W resistor is _____.



a) 1.0 b) 0.5 c) 3.0 d) 2.0

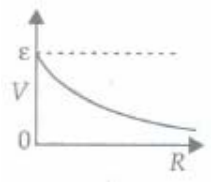
4. A charge is moving across a junction, then
   a) momentum will be conserved b) momentum will not be conserved.
   c) at some places momentum will be conserved and at some other places momentum will not be conserved.
   d) none of these.

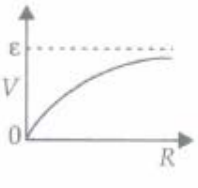
5. A battery of 10 V and internal resistance 0.5 Ω is connected across a variable resistance R. The value of R for which the power delivered is maximum is equal to _____.
   a) 0.25 Ω b) 0.5 Ω c) 1.0 Ω d) 2.0 Ω

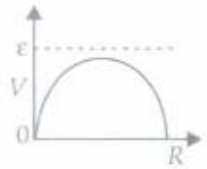
6. A boy has two spare light bulbs in his drawer. One is marked 240 V and 100Wand the other is marked 240 V and 60 W He tries to decide which of the following assertions are correct?
   a) The 60 W light bulb has more resistance and therefore burns less brightly.
   b) The 60 W light bulb has less resistance and therefore burns less brightly.
   c) The 100 W bulb has more resistance and therefore burns more brightly
   d) The 100W bulb has less resistance and therefore burns less brightly.

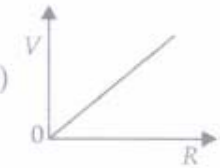
7. Consider the following two statements:
   (i) Kirchhoff's junction law follows from the conservation of charge.
   (ii) Kirchhoff's loop law follows from the conservation of energy.
   Which of the following is correct?
   a) Both (i) and (ii) are wrong b) (i) is correct and (ii) is wrong c) (i) is wrong and (ii) is correct
   d) Both (i) and (ii) are correct

8. A wire connected in the left gap of a meter bridge balance a 10 Q resistance in the right gap to a point, which divides the bridge wire in the ratio 3 : 2. If the length of the wire is 1m. The length of one ohm wire is:
   a) 0.057 m b) 0.067 m c) 0.37 m d) 0.134 m
9. A cell having an emf e and internal resistance r is connected across a variable external resistance R. As the resistance R is increased, the plot of potential difference V across R is given by

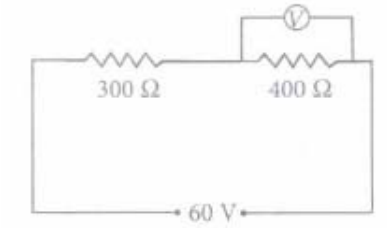
a) 

b) 

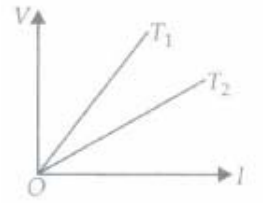
c) 

d) 

10. The resistance of wire in a heater at room temperature is 65 Ω . When the heater is connected to a 220 V supply the current settles after a few seconds to 2.8 A. What is the steady temperature of the wire. (Temperature coefficient of resistance α = 1. 70 $\times$ 10^{-4} °C^{-1})
    a) 955°C b) 1055°C c) 1155°C d) 1258°C
11. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
    Assertion : Some electric appliance have three pins, even though if we remove the top pin, it will continue working.
    Reason : The third pin is used only as a safety device.
    a) If both assertion and reason are true and reason is the correct explanation of assertion.
    b) If both assertion and reason are true but reaso is not the correct explanation of assertion
    c) If assertion is true but reason is false. d) If both assertion and reason are false
12. A heater is designed to operate with a power of 1000W in a 100 V line. It is connected in combination with a resistance of 10 Ω and a resistance R, to a 100 V mains as shown in the figure. What will be the value of R so that the heater operates with a power of 62.5 W?

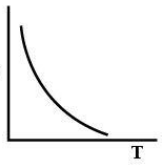


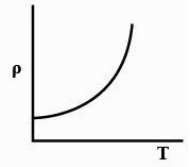
    a) 15Ω b) 10Ω c) 5Ω d) 25Ω
13. The voltage V and current I graphs for a conductor at two different temperatures T_1 and T_2 are shown in the figure. The relation between T_1 and T_2 is

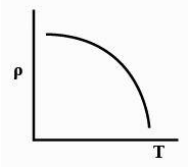


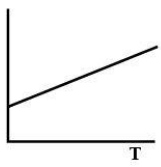
    a) $T_1 > T_2$ b) $T_1 < T_2$ c) $T_1 = T_2$ d) $T_1 = \frac{1}{T_2}$
14. Kirchhoff's first law, i.e., Si = 0 at a junction, deals with the conservation of _____.
    a) angular momentum b) linear momentum c) energy d) charge
15. When a wire of uniform cross-section a, length/and resistance R is bent into a complete circle, resistance between any two of diametrically opposite points will be:
    a) $\frac{R}{4}$ b) 4R c) $\frac{R}{8}$ d) $\frac{R}{2}$

16. A student rneasures the tenninal potential difference (V) of a cell (of emf E and internal resistance r) as a function of the current (I) flowing through it. The slope and intercept, of the graph between V and I, then, respectively, equal: _____.
    a) -r and E b) r and -E c) -E and r d) E and -r

17. Which of the following graph represents the variation of resistivity (r) with temperature (T) for copper?
    a) 

    b) 

    c) 

    d) 

18. The resistance of the four p, e, R and S in a Wheatstone,s bridge are 10 ohm, 30 ohm, 30 ohm and 90 ohm, respectively. The e.m.f. and internal resistance of the cell are 7 volt and 5 ohm respectively. If the galvanometer resistance is 50 ohm, the current drawn from the cell will be _____.
    a) 0.2 A b) 0.1 A c) 2.0 A d) 1.0 A

19. The rate of increase of themo e.m.f. with temperature at the neutral temperature of a thermocouple _____.
    a) is positive b) is zero c) depends upon the choice of the two materials of the thermocouple
    d) is negative

20. If the resistance of a conductor is 5W at 50^{o}C and 7Ω at 100^{o}C, then the mean temperature coefficient of resistance (of the material) is _____.
    a) 0.01/^{o}C b) 0.04/^{o}C c) 0.06/^{o}C d) 0.08/^{o}C

21. A current of 21, passing through a conductor produces 80 J of heat in 10s. The resistance of the conductor in ohm is _____.
    a) 0.5 b) 2 c) 4 d) 20

22. A current of 2A flows through a 2Ω resistor when connected across a battery. The same battery supplies a current of 0.5 A when connected across a 9Ω resistor. The internal resistance of the battery is _____.
    a) 0.5 Ω b) 1/3 Ω c) 1/4 Ω d) 1 Ω

23. If 25Ω, 220 V and 100Ω, 220 V bulbs are connected in series across a 440 V line, then _____.
    a) only 25Ω bulb will fuse b) only 100Ω bulb will fuse c) both bulbs will fuse d) none of these

24. In an atom electrons revolves around the nucleus along a path of radius 0.72 $\mathring{A}$ making 9.4 $\times$ 10^{18} revolution per second. The equivalent current is (e = 1.6 $\times$ 10^{-19} C)
    a) 1.2 A b) 1.5 A c) 1.4 A d) 1.8 A

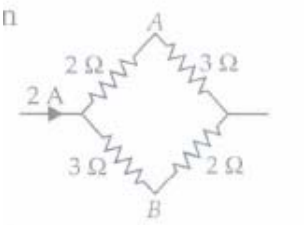
25. In meter bridge, the balancing length from left is found to be 20 cm when standard resistance of 1Ω is in right gap. The value of unknown resistance is _____.
    a) 0.25 Ω b) 0.4 Ω c) 0.5 Ω d) 4 Ω

26. When a current of 2 A flows in a battery from negative to positive terminal, the potential difference across it is 12 V If a current of 3 A flowing in the opposite direction produces a potential difference of 15 V, the emf of the battery is
    a) 12.6 V b) 13.2 V c) 13.5 V d) 14.0 V

27. The color code of a resistance is given below
    

    The vaiues ofresistance and tolerance, respectively, are:
    a) 470Ω,5% b) 470kΩ,5% c) 47kΩ,10% d) 4.7 kΩ,5%

28. The potential difference between A and B as shown in figure is

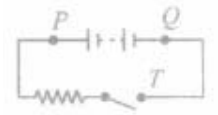


a) 1 V b) 2 V c) 3 V d) 4 V

29. An electric kettle has two heating coils. When one of the coils is connected to an a.c. source, the water in the kettle boils in 10 minutes. When the other coil is used, the water boils in 40 minutes. If both the coils are connected in parallel, the time taken by the same quantity of water to boil will be _____.
a) 15 min b) 8 min c) 4 min d) 25 min

30. n resistors each of resistance R first combine to give maximum effective resistance and then combine to give minimum effective resistance. The ratio of the maximum to minimum resistance is
a) n b) n^2 c) n^2-1 d) n^3

31. A battery, an open switch and a resistor are connected in series as shown in figure. Consider the following three statements concerning the circuit. A voltmeter will read zero if it is connected across points



(i) P and T (Ii) P and Q (iii) Q and T
Which one of the above is/are true?
a) only (i) and (iii) b) (i), (ii) and (iii) c) only (i) d) only (iii)

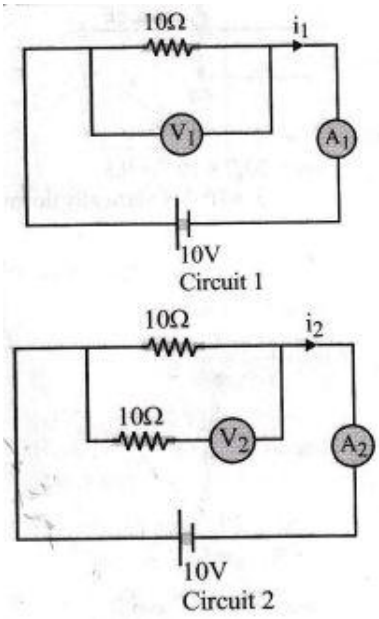
32. 1 ampere current is equivalent to
a) 6.25×10^{18} electrons S^{-1} b) 2.25×10^{18} electrons S^{-1} c) 6.25×10^{14} electrons S^{-1}
d) 2.25×10^{14} electrons S^{-1}

33. The battery of a trunk has an emf of 24 V If the internal resistance of the battery is 0.8 Ω. What is the maximum current that can be drawn from the battery?
a) 30 A b) 32 A c) 33 A d) 34 A

34. A 5^oC rise in temperafure is observed in a conductor by passing a current. When the current is doubled the rise in temperature will be approximately _____.
a) 16^oC b) 10^oC c) 20^oC d) 12^oC

35. 40 electric bulbs are connected in series across a 220 V supply. After one bulb is fused the remaining 39 are connected again in series across the same supply. The illumination will be
a) more with 40 bulbs than with 39 b) more with 39 bulbs than with 40 c) equal in both the cases
d) in the ratio 40^2:39^2

36. In the circuits shown below, the readings of voltmeters and the ammeters will be _____.



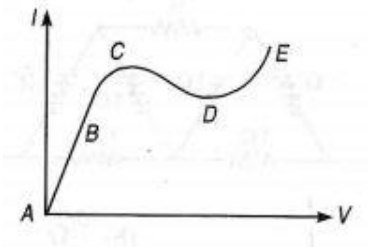
a) $V_1=V_2$ and $i_1>i_2$ b) $V_1=V_2$ and $i_1=i_2$ c) $V_1>V_2$ and $i_1>i_2$ d) $V_2>V_1$ and $i_1=i_2$

37. In the series combination of n cells each cell having emf ϵ and internal resistance r. If three cells are wrongly connected, then total emf and internal resistance of this combination will be
a) $n\epsilon$, (nr-3r) b) $(n\epsilon - 2\epsilon)$, nr c) $(n\epsilon - 4\epsilon)$, nr d) $(n\epsilon - 6\epsilon)$, nr

38. In a meter bridge, the balancing length from the left end (standard resistance of one ohm is in the right gap) is found to be 20 cm. The value of the unknown resistance is:
a) 0.8 Ω b) 0.5 Ω c) 0.4 Ω d) 0.25 Ω

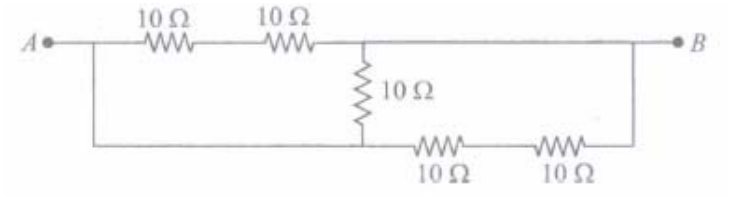
39. Resistances P, Q, S and R are arranged in a cyclic order to form a balanced Wheatstone's network. The ratio of power consumed in the branches (P + Q) and (R + S) is:
a) 1: 1 b) R: P c) p^2: Q^2 d) p^2: R^2

40. From the graph between current I and voltage V shown in figure, identify the portion corresponding to negative resistance.



a) DE b) CD c) BC d) AB

41. Five equal resistances of 10Ω are connected between A and B as shown in figure. The resultant resistance is



a) 10Ω b) 5Ω c) 15Ω d) 6Ω

42. A charged particle having drift velocif of 7 .5 x 10^{-4}ms^{-1} is an electric field of 3 x 10^{-10} Vm^{-1}, has a mobility in $m^2V^{-1}s^{-1}$ of _____.
a) 2.25 x 10^{-15} b) 2.25 x 10^{15} c) 2.5 x 10^6 d) 2.15 x 10^6

43. Ten identical cells connected in series are needed to heat a wire of length one metre and radius 'r' by 10^oC in time 't'. How many cells will be required to heat the wire of length two metre of the same radius by the same temperature in time _____.
    a) 10 b) 20 c) 30 d) 40

44. A copper cylindrical tube has inner radius a and outer radius b. The resistivity is ρ . The resistance of the cylinder between the two ends is
    a) $\frac{\rho l}{b^2-a^2}$ b) $\frac{\rho l}{2\pi(b-a)}$ c) $\frac{\rho l}{\pi(b^2-a^2)}$ d) $\frac{\pi\left(b^2-a^2\right)}{\rho l}$

45. A potentiometer consists of a wire of length 4 m and resistance 10 Ω. It is connected to a cell of e.m.f. 2 V. The potential difference per unit length of the wire will be :
    a) 0.5 V/m b) 2 V/m c) 5 V/m d) 10 V/m

46. A wire of length L and resistance R is stretched to get the radius of cross-section half. What is new resistance :
    a) 5 R b) 8 R c) 4 R d) 16 R

47. If n cells each of emf ϵ and internal resistance r are connected in parallel, then the total emf and internal resistances will be
    a) $\epsilon, \frac{r}{n}$ b) $\epsilon,\ nr$ c) $n\epsilon, \frac{r}{n}$ d) $n\varepsilon, nr$

48. Point out the right statements about the validity of Kirchhoff's junction rule
    a) it is based on conservation of charge.
    b) outgoing currents add up and are equal to incoming currents at a junction.
    c) bending or reorienting the wire does not change the validity of Kirchhoff's junction rule. d) all of above

49. Two identical batteries each of emf 2V and internal resistance 1Ω are available to produce heat in an external resistance by passing a current through it. The maximum power that can be developed across R using these batteries is _____.
    a) 3.2Ω b) $2\ \Omega$ c) $1.28\ \Omega$ d) $\frac{8}{9}\ \Omega$

50. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
    Assertion : Electrons which constitute the current are negatively charged.
    Reason : Current carrying wire is negatively charged
    a) If both assertion and reason are true and reason is the correct explanation of assertion.
    b) If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false. d) If both assertion and reason are false