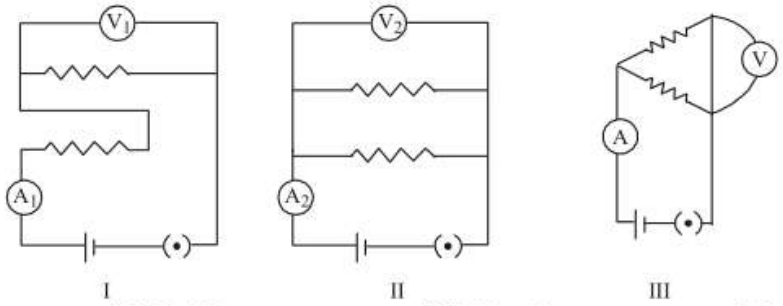
Electricity Lab skill solved questions class 10

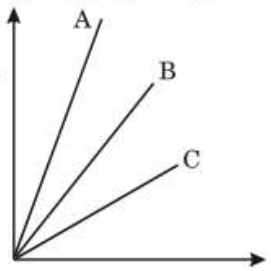
1. Three students drew following circuit diagrams to find resistance of parallel combination of two resistors. [Board Term 1 2012 (15)]
Correct circuit diagram/diagrams are :



I II III

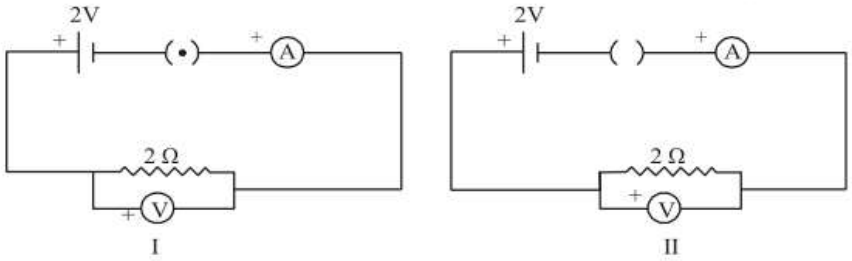
(A) I, II (B) II, III (C) II only (D) I only

2. Ohm's law experiment is performed separately with individual resistors R_1, R_2 [$R_1 > R_2$] and series combination of R_1, R_2. Graph is plotted between potential difference (V) and current (I) as shown in figure for each case :
Identify which one is for R_1, R_2 and combination of resistors in the graph A, B and C respectively represents. [Board Term I 2012 (15)]



(A) R_1, R_2 and series combination
(B) series combination R_2, R_1
(C) R_2, R_1 and series combination
(D) series combination, R_1, R_2

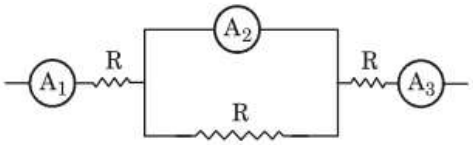
3. For the circuits shown in figures I and II the voltmeter reading would be :
[Board Term I 2012 (31)]



I II

(A) 2 V in circuit I and 0 V in circuit II (B) 0 V in both circuits
(C) 2 V in both circuits (D) 0 V in circuit I and 2 V in circuit II

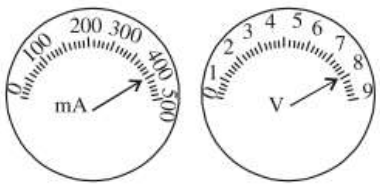
4. The statement that is most correct about the readings of ammeters A_1, A_2 and A_3 connected in the following circuit (currents read by each are shown by I_1, I_2, I_3 respectively).
[Board Term 1 2012 (18)]



(A) $I_1 < I_2$ (B) $I_3 < I_2$ (C) $I_1 = I_2 = I_3$ (D) $I_1 = I_3$

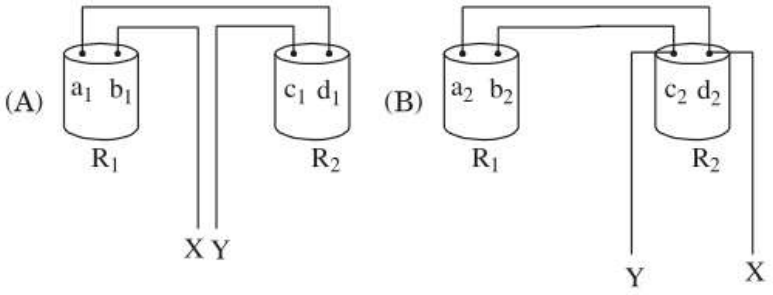
5. An ammeter has a range of (0–5A) ampere and there are 50 divisions on its scale. What is its least count ? [Board Term 1 2012 (31)]
(A) 10 A (B) 27 A (C) 0.1 A (D) 0.01 A

6. The readings of current flowing through a conductor and the potential difference across its two ends are shown in the ammeter and voltmeter given below. The resistance of the current would be : [Board Term 1 2012 (31)]

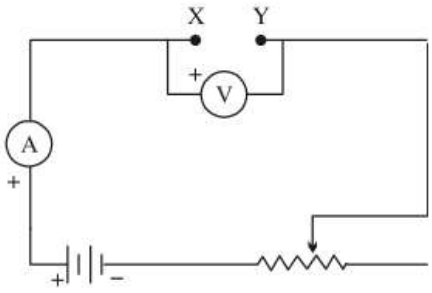


(A) 20 Ω (B) 5 Ω
(C) 2 Ω (D) 0.2 Ω

7. **Two students (A) and (B) connected their two given resistors R_1 and R_2 in the manners shown below :**



Student A connects the terminals marked b_1 and c_1 while B connects the terminals marked d_2 and c_2 in their respective circuits at the points marked X and Y.



The equivalent resistance measured by A and B will be : **[Board Term 1 2012 (31)]**

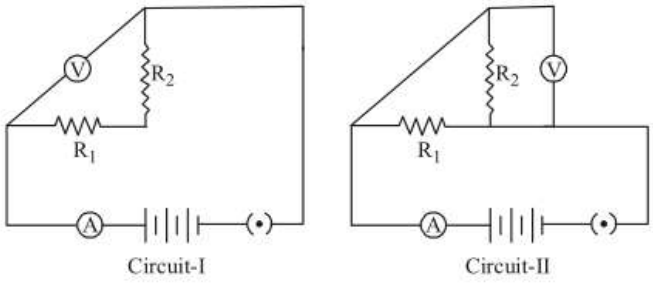
(A) of series combination of the two resistors.

(B) of the parallel combination of the two resistors.

(C) of series combination for student A while parallel combination of the two resistors for B.

(D) of the parallel combination for A while of the series combination of the two resistors for B.

8. **In the circuits given below the resistors R_1 and R_2 are connected :** **[Board Term I 2012 (37)]**



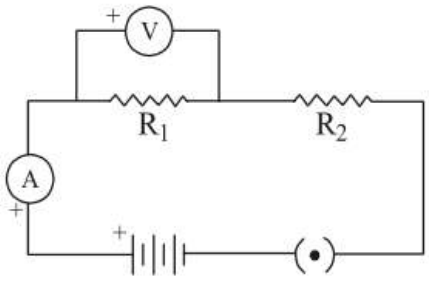
(A) in parallel in both circuits

(B) in series in both circuits

(C) in parallel in circuit I and series in circuit II

(D) in series in circuit I and parallel in circuit II

9. **A student sets up an electric circuit shown here for finding the equivalent resistance of two resistors in series. In this circuit.** **[Board Term 1 2012 (37)]**



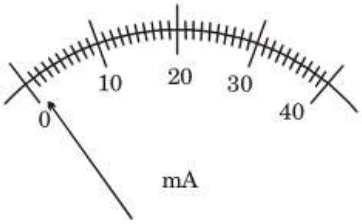
(A) resistors have been connected correctly but the voltmeter has been wrongly connected.

(B) resistors have been connected correctly but the ammeter has been wrongly connected.

(C) resistors as well as voltmeter have been wrongly connected.

(D) resistors as well as ammeter have been wrongly connected.

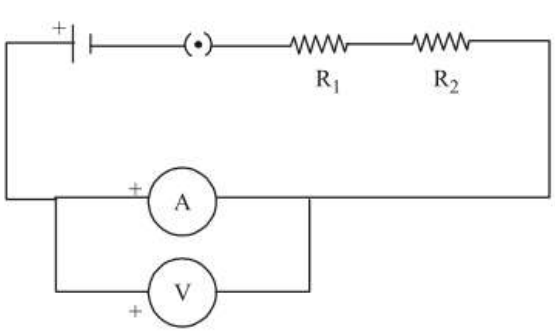
10. **An ammeter has 20 divisions between 20 mA and 30 mA as marked. The least count of the ammeter.** **[Board Term I 2012 (38)]**



(A) 0.5 mA **(B)** 1 mA

(C) 0.25 mA **(D)** 0.05 mA

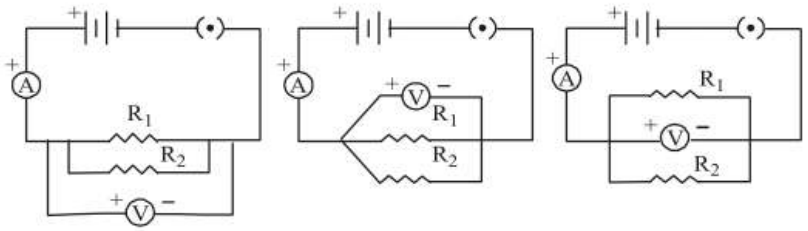
11. To determine the equivalent resistance of a series combination of two resistors R_1 and R_2, a student arranges the following set-up.



Which one of the following statements will be true for this circuit ?

(A) he will get incorrect reading for current I and potential difference V both.
(B) he will get correct reading for current I but incorrect reading for potential difference V.
(C) he will get correct reading for potential difference V but incorrect reading for current I.
(D) he will get correct readings for both V and I.

12. In the experiment on finding the equivalent resistance of two resistors connected in parallel, three students connected the voltmeter in their circuits in the three ways X, Y and Z shown here :



The voltmeter has been correctly connected in : **[Board Term I 2012 (39)]**

(A) X and Y only
(B) Y and Z only
(C) Z and X only
(D) all the three cases

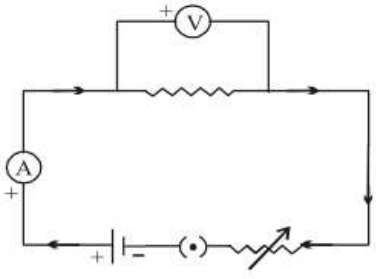
13. The rest position of the needles in a milliammeter and voltmeter when not being used in a circuit are as shown in the figure. The zero-error and least count of these two instruments are : **[Board Term I 2012 (39)]**

(A) (– 4mA, – 0.2V) and (1mA, 0.1V) respectively
(B) (+ 4mA, + 0.2V) and (2mA, 0.2V) respectively
(C) (– 4mA, – 0.2V) and (2mA, 2V) respectively
(D) (+ 4mA, + 0.2V) and (1mA, 0.1V) respectively

14. If a student while studying the dependence of current on the potential difference keeps the circuit closed for a long time to measure the current and potential difference, then : **[Board Term I 2012 (40)]**

(A) ammeter's zero error will change
(B) ammeter will show more reading than the actual one
(C) voltmeter will show higher readings than actual one
(D) resistor will get heated up and its value will change

15. Which two circuit components are shown connected in parallel in the following circuit diagram ?

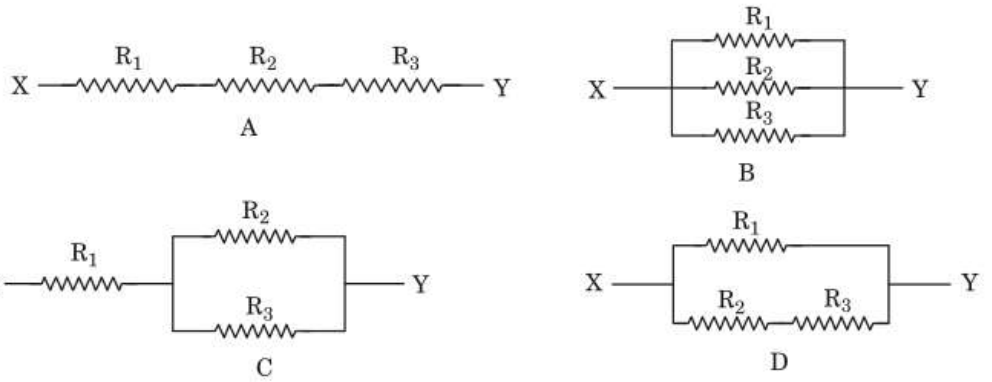


(A) rheostat and Voltmeter
(B) voltmeter and Ammeter
(C) voltmeter and Resistor
(D) ammeter and Resistor

16. **In an experiment on studying the dependence of the current (I), flowing through a given resistor, on the potential difference (V) applied across it, a student is to change the value of the current. For doing this, he should change the :**
(A) number of cells used (B) resistor itself
(C) ammeter used in the circuit (D) voltmeter used in the circuit

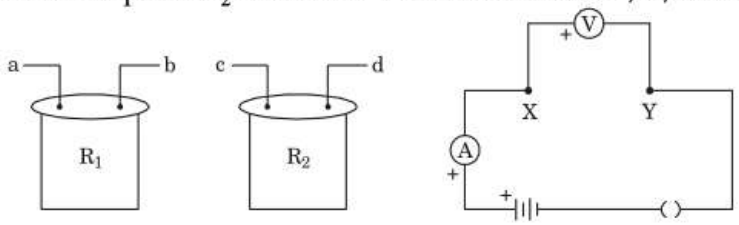
17. **We use thick copper wires as connecting wires for studying the dependence of current on the potential difference across a resistor. The reason of using thick copper wire is its :**
(A) easy availability (B) low cast
(C) high resistance (D) low resistance

18. **To determine the equivalent resistance of three resistors R_1, R_2 and R_3 which connected in parallel arrangement, four students, A, B, C and D connected the resistors as follows :**



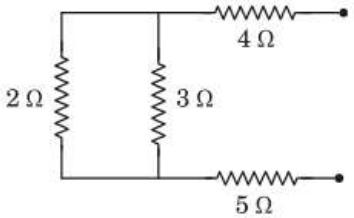
The correct arrangement of the resistors is that of student :
(A) A (B) B (C) C (D) D

19. **You have two resistors R_1 and R_2 with their terminals marked a, b, c and d as shown.**



In order to find the equivalent resistance of series combination of the two resistor R_1 and R_2 how would you connect the terminals of the resistors R_1 and R_2 to the terminals X and Y in the circuit shown in the figure.
(A) X to a : b to c and d to Y (B) X to a : b to d and c to Y
(C) X to b : a to d and c to Y (D) In any of the three manners given above

20. **Study the combination of resistors given below and find the two resistors in parallel combination.**
(A) 2 Ω and 3 Ω
(B) 3 Ω and 4 Ω
(C) 3 Ω and 5 Ω
(D) 2 Ω and 5 Ω



ANSWERS

1. (C) This diagram is correct.
2. (D) This is series combination.
3. (A) 2 V in circuit I as key is closed and 0 V in circuit II.
4. (D) As ammeter A_1 and A_3 are in series so, $I_1 = I_3$.
5. (C) Least count $= \frac{\text{Range}}{\text{Total division}} = \frac{5}{50} = 0.1$ A.
6. (A) $R = \frac{V}{I} = \frac{8 \text{ Volt}}{400 \text{ mA}} = \frac{8 \times 10^3}{400} = 20\Omega$.
7. (C) a_1d_1 is the common node in A so series, b_2, c_2 pair and a_2, d_2 pair of points are at same potential. So parallel in B.
8. (D) Series is circuit I and as V is parallel circuit II, so R is also parallel.
9. (A) Resistors are connected correctly but voltmeter has been wrongly connected.
10. (D) Least count $= \frac{\text{Range}}{\text{Total division}} = \frac{10 \text{ mA}}{20} = 0.05$ mA.
11. (B) Correct reading for current but incorrect reading for potential difference.
12. (D) Voltmeter has to be connected in parallel to the resistors where the potential drop has to be measured.
13. (B) Zero error is (+ 4 mA, + 0.2 V) and least count is (2 mA, 0.2 V).
14. (D) Resistor will get heated up and its value will change.
15. (C) Voltmeter and resistor are connected in parallel.
16. (A) Number of cells used.
17. (D) $R \propto P\frac{l}{A}$ = when area is large resistance is law.
18. (B) Correct connection.
19. (D) R_1 and R_2 has one common point, so any of the three manners can be followed.
20. (A) 2 Ω and 3 Ω are connected in parallel whereas 3 Ω, 4 Ω and 5 Ω are in series.