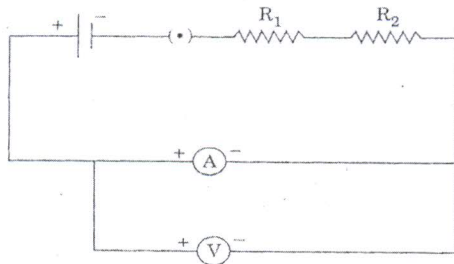




Part- A 1. In an experiment on studying the dependence of the current (I), flowing through a given resistor, on the potential difference (V) applied across it, a student is to change the value of the current. For doing this, he can change the

- (1) number of cells used or by setting the battery eliminator
- (2) resistor itself
- (3) ammeter used in the circuit
- (4) voltmeter used in the circuit

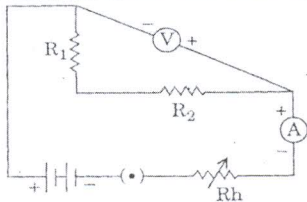
2. To determine the equivalent resistance of a series combination of two resistors R_1 and R_2 , a student arranges the following set-up :



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

- (1) Incorrect reading for current I as well as potential difference V .
- (2) Correct reading for current I but incorrect reading for potential difference V .
- (3) Correct reading for potential difference V but incorrect reading for current I .
- (4) Correct reading for both current I and potential difference V .

3. For the experiment "to find the equivalent resistance of the two given resistors connecte in parallel" the following circuit was drawn by a student.



The teacher pointed out the possibility of the following faults :

- A. The ammeter was not correctly connected in the circuit.
- B. The voltmeter was not correctly connected in the circuit.
- C. The resistors, R_1 and R_2 were not correctly connected in parallel.
- D. The rheostat and the key were not correctly connected in the circuit.

The two faults pointed out correctly by the teacher, are

- (1) A and B
- (2) B and C
- (3) C and D
- (4) D and A



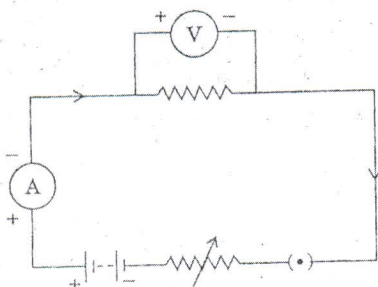
Estd. 1979

4. Milliammeter A_2 of range 0 – 200 mA and least count 20 mA
 Voltmeter V_1 of range 0 – 5 V and least count 0.2 V
 Voltmeter V_2 of range 0 – 3 V and least count 0.3 V

Out of the following pairs of instruments, which pair would be the best choice for carrying out the experiment to determine the equivalent resistance of two resistors connected in series ?

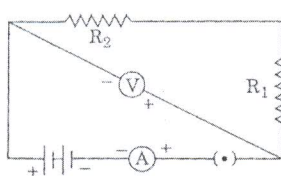
- (1) Milliammeter A_1 and voltmeter V_1
- (2) Milliammeter A_2 and voltmeter V_2
- (3) Milliammeter A_1 and voltmeter V_2
- (4) Milliammeter A_2 and voltmeter V_1

5. The following circuit diagram shows the experimental set-up for the study of dependence of current on potential difference. Which two circuit components are connected in series ?

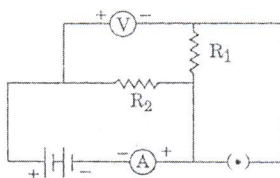


- (1) Battery and voltmeter
- (2) Ammeter and voltmeter
- (3) Ammeter and rheostat
- (4) Resistor and voltmeter

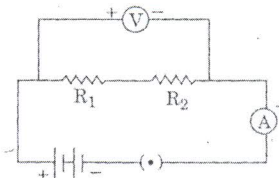
6. For determining the equivalent resistance of two resistors R_1 and R_2 connected in series, three students X, Y and Z set up their circuits as shown below.



X



Y



Z

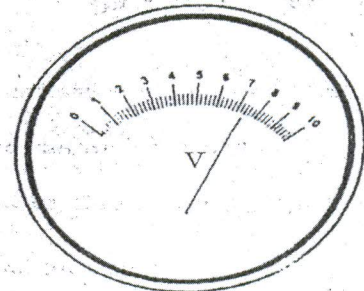
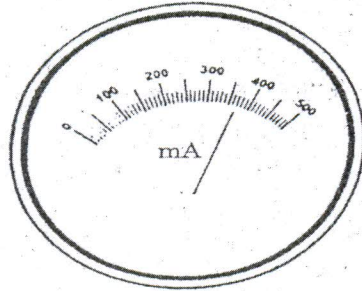
The correct set-up is that of

- (1) Student X only
- (2) Student Y only
- (3) Student Z only
- (4) Students X and Z

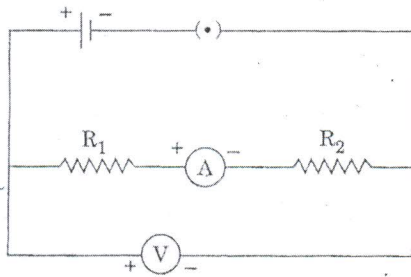


07. The current flowing through a conductor and the potential difference across its two ends are as per readings of the ammeter and the voltmeter shown below. The resistance of the conductor would be

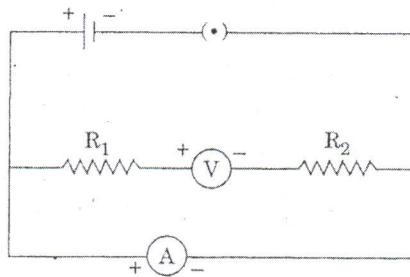
- (1) 0.02Ω
- (2) 0.024Ω
- (3) 20.0Ω
- (4) 24.0Ω



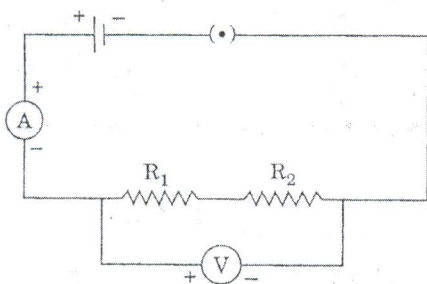
08. In an experiment to determine equivalent resistance of two resistors R_1 and R_2 in series which one of the following circuit diagrams shows the correct way of connecting voltmeter in the circuit?



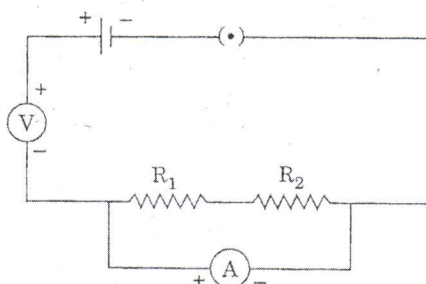
I



II



III

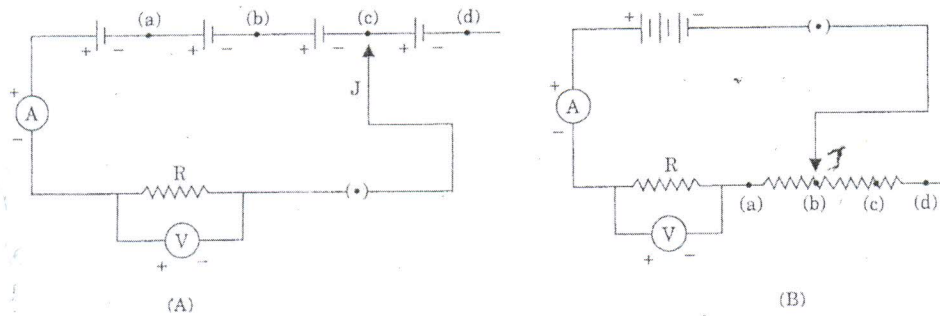


IV

- (1) I
- (2) II
- (3) III
- (4) IV

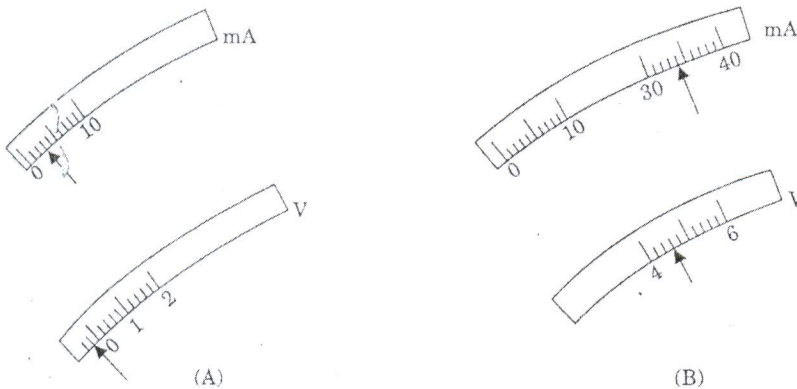


09. To study the dependence of the current (I) on the potential difference (V), across a resistor, two students used two set-ups shown in figures (A) and (B) respectively. They kept the contact J in four different positions, marked (a), (b), (c) and (d) in the two figures.



For the two students, the value of the emf used by student (A) and the resistance due to the rheostat used by student (B), will each be minimum when the contact J is in the position

- (1) (d) in both the set-ups
 - (2) (a) in both the set-ups
 - (3) (d) in set-up (A) and (a) in set-up (B)
 - (4) (a) in set-up (A) and (d) in set-up (B)
10. The 'rest' positions of the needle in a milliammeter and a voltmeter were as shown in Figure A. When a student used these in her experiment, the final readings of the needle were in the positions shown in Figure B.

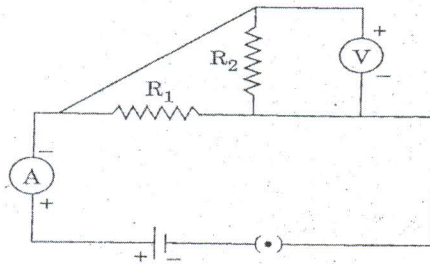


The correct readings of the two instruments are

- (1) 34 mA and 4.2 V respectively
- (2) 37 mA and 4.8 V respectively
- (3) 31 mA and 4.8 V respectively
- (4) 31 mA and 4.2 V respectively

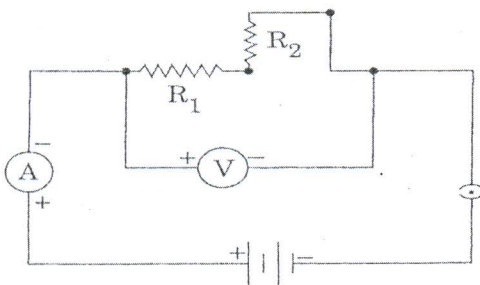


11. Which of the circuit components in the following circuit diagram are connected in parallel?

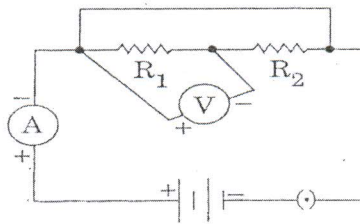


- (1) R_1 and R_2 only
- (2) R_2 and V only
- (3) R_1 and V only
- (4) R_1 , R_2 and V

12. Out of the two circuits shown here, the two resistors R_1 and R_2 have been correctly connected in series in



(A)



(B)

- (1) circuit A only
- (2) circuit B only
- (3) both circuits A and B
- (4) neither of the two circuits

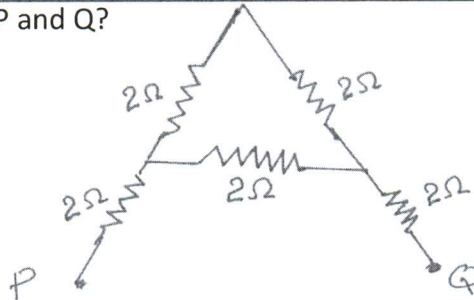
13. In a voltmeter, there are 20 divisions between the 0 mark and 0.5 V mark. The least count of the voltmeter is

- (1) 0.020 V
- (2) 0.025 V
- (3) 0.050 V
- (4) 0.250 V

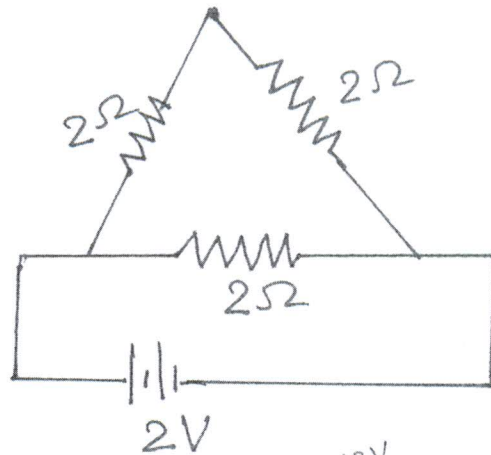


Part – B (Answer the following:)

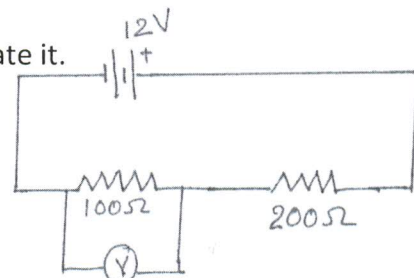
1. What is the value of resistance between P and Q?



2. What is the current in the given circuit?



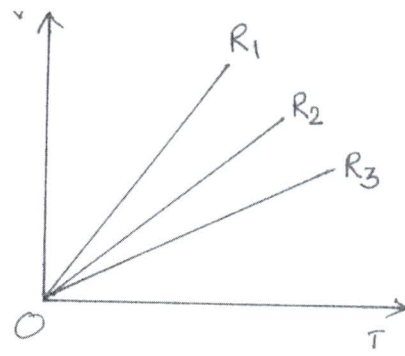
3. In the given circuit reading of voltmeter V is unknown. Calculate it.



4. A wire of resistance 4Ω is bent to form a circle. What is the resistance between two diametrically opposite ends?

5. V-I graphs for three resistors is given.

Which of the three has minimum and which has maximum resistance?

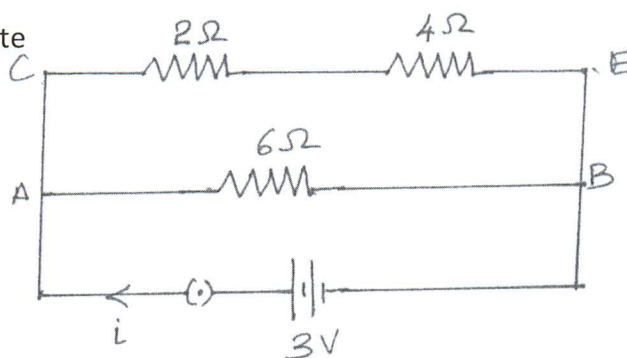




6. Two wires of equal lengths one of copper and the other of manganin (an alloy) have the same thickness. Which of them can be used for-
- electrical transmissions lines
 - electrical heating devices?
7. Series arrangement is not used for household circuits. Why?
8. A wire is 1m long, 0.2mm in diameter and has a resistance of 10Ω .Calculate its resistivity?
9. A piece of wire of resistance 20Ω in drawn out so that its length is increased to twice its original length. Calculate the resistance of the wire in the new situation.

10. In the circuit diagram shown, calculate

- Total resistance of arm CE.
- Total current.
- Current in arm AB & CE.
- P.D across 2Ω and 4Ω resistance.



Happy Vacation!

Dept. of Physics, SIS