ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

WORK SHEET 17

Subject : PHYSICS

CLASS : XII

16.6.20

Chapter : Current Electricity

Topic : Wheatstone bridge, meter bridge

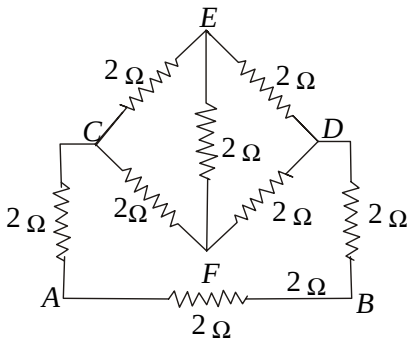
Multiple Choice Question : **1 x 15 = 15**

1. The Wheatstone bridge and its balance condition provide a practical method for determination of an

   (a) known resistance (b) unknown resistance

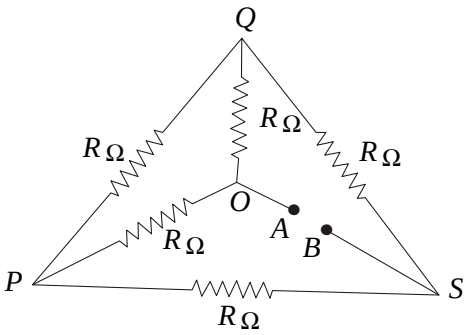
   (c) both (a) and (b) (d) none of the above

2. The resistance of the following circuit between A and B is



   (a) (3/2) Ω (b) 2 Ω (c) 4 Ω (d) 8 Ω

3. If each of the resistance in the network in figure is R, the equivalent resistance between terminals A and B is



   (a) $5R$ (b) $2R$ (c) $4R$ (d) R

4. The resistances of the four arms P, Q, R and S in a Wheatstone's bridge and 10 Ω, 30 Ω, 30 Ω and 90 Ω respectively. The emf and internal resistance of the cell are $7V$ and 5 Ω respectively. If the galvanometer resistance is 50 Ω, the current drawn from the cell will be

   (a) $1.0A$ (b) $0.2A$ (c) $0.1A$ (d) $2.0A$

5. In meter bridge for measurement of resistance, the known and the unknown resistances are interchanged. The erroor so removed is

   (a) end correction (b) index error (c) due to temperature effect (d) random error

6. Resistances P and Q are connected in the gaps of metre-bridge. The balancing point is obtained $\frac{1}{3}$ m from the zero end. If a $6\,\Omega$ resistance is connected in series with P, the balance point shifts to $\frac{2}{3}$ m from the same end. P and Q are

(a) $4\,\Omega$, $2\,\Omega$ (b) $2\,\Omega$, $4\,\Omega$

(c) both (a) and (b) (d) neither (a) nor (b)

7. Wheatstone bridge is suitable for measuring

(a) low resistance (b) intermediate resistance

(c) high resistance (d) zero resistance

8. Copper wire is not used as the bridge wire in a meter bridge because

(a) resistance of copper wire changes due to change in temperature

(b) resistance of a copper wire is very small

(c) in case of copper the error due to thermoelectric effect is very great

(d) thermoelectric effect sets in at the two ends of a copper wire

9. The effective length of the wire of a metre bridge is, in general, more than 1 m because of

(a) Joule heating of the wire

(b) thermoelectric effect at the two ends of the wire

(c) junction defects at the two ends of the wire

(d) elastic stress generated in the wire.

10. A resistance of $1\,\Omega$ is kept in the left gap of a metre bridge and another resistance of $3\,\Omega$ is kept in the right gap. The left and right gap. The left and right end errors of the metre wire are 3 cm and 1 cm respectively. The null point would be at

(a) 22.0 cm (b) 23.0 cm (c) 25.0 cm (d) 26.0 cm

11. Resistance in the two gaps of a meter bridge are $10\,\Omega$ and $30\,\Omega$ respectively. If the resistances are interchanged the balance point shifts by

(a) 33.3 cm (b) 66.67 cm (c) 25 cm (d) 50 cm

12. In which case will the null condition of a Wheatstone bridge change?

(a) if the resistances in different arms are changed

(b) if the positions of the battery and the galvanometer are interchanged

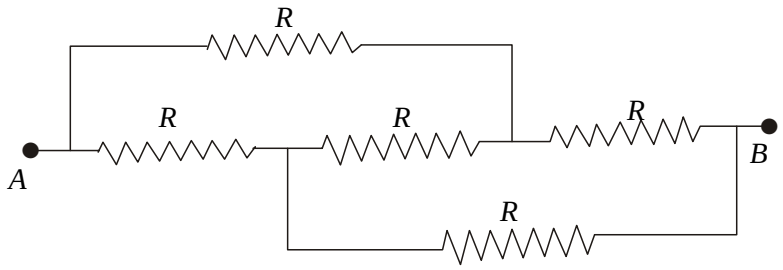
(c) if a battery of different emf is used

(d) if a galvanometer of different resistance is used

13. The resistances of the four arms of a Wheatstone bridge are $1\,\Omega$, $3\,\Omega$, $2\,\Omega$ and $6\,\Omega$ respectively and the resistance of the galvanometer is $1000\,\Omega$. The equivalent resistance of the combination is

(a) $12\,\Omega$ (b) $1000\,\Omega$ (c) $2.67\,\Omega$ (d) $2.4\,\Omega$

14. In the figure, if the value of each resistance be R then what will be equivalent resistance between the points A and B?



(a) $\frac{R}{5}$ (b) $\frac{R}{2}$ (c) R (d) $\frac{3R}{2}$

15. In a balanced Wheatstone bridge if the battery and the galvanometer are interchanged then the bridge remains —

(a) balanced (b) unbalanced (c) non-responsive (d) cannot be explained

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