

Exercise - I

(OBJECTIVE PROBLEMS)

Q.1 A vernier callipers having 1 main scale division = 0.1 cm is designed to have least count of 0.02 cm. If n be the number of divisions on vernier scale and m be the length of vernier scale, then

- (A) $n = 10$, $m = 0.5$ cm (B) $n = 9$, $m = 0.4$ cm
(C) $n = 10$, $m = 0.8$ cm (D) $n = 10$, $m = 0.2$ cm

Q.2 In a Vernier Calipers (VC), N divisions of the main scale coincide with $N + m$ division of the vernier scale. What is the value of m for which the instrument has minimum least count ? ($N > 2$)

- (A) 1 (B) N
(C) Infinity (D) $N/2$

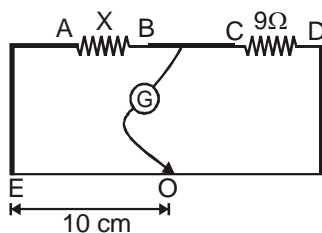
Q.3 In the Searle's experiment, after every step of loading, why should we wait for two minutes before taking the readings ? (More than one correct.)

- (A) So that the wire can have its desired change in length
(B) So that the wire can attain room temperature.
(C) So that vertical oscillations can get subsided.
(D) So that the wire has no change in its radius.

Q.4 In a meter bridge set up, which of the following should be the properties of the one meter long wire ?

- (A) High resistivity and low temperature coefficient
(B) Low resistivity and low temperature coefficient
(C) Low resistivity and high temperature coefficient
(D) High resistivity and high temperature coefficient

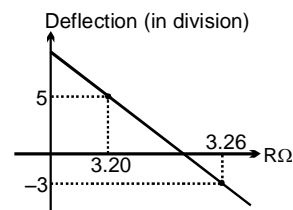
Q.5 Consider the MB shown in the diagram, let the resistance X have temperature coefficient α_1 and the resistance from the RB have the temperature coefficient α_2 . Let the reading of the meter scale be 10cm from the LHS. If the temperature of the two resistance increase by small temperature ΔT then what is the shift in the position of the null point ? Neglect all the other changes in the bridge due to temperature rise.



- (A) $9(\alpha_1 - \alpha_2)\Delta T$ (B) $9(\alpha_1 + \alpha_2)\Delta T$
(C) $\frac{1}{9}(\alpha_1 + \alpha_2)\Delta T$ (D) $\frac{1}{9}(\alpha_1 - \alpha_2)\Delta T$

Q.6 For a post office Box, the graph of galvanometer deflection versus R (resistance pulled out of RB) is given as shown. A careless student pulls out two non consecutive values R

marked in the graph. Find the value of unknown resistance.



- (A) 3.2 ohm (B) 3.24 ohm
(C) 3.206 (D) 3.26

Q.7 Identify which of the following diagrams represent the internal construction of the coils wound in a resistance box or PO box ?

