

Materials and apparatus for Question 1 (per set of apparatus unless otherwise specified)

1. Stand of height at least 60 cm.
2. Clamp.
3. Boss.
4. Piece of 16 SWG copper wire of approximate diameter 1.68 mm and approximate length 50 cm.
5. Cork, e.g., from a bottle. See Note 1.
6. Pin of approximate length 3 cm. See Note 1.
7. Stop-watch reading to the nearest 0.1 s or better.
8. 30 cm ruler with a millimetre scale.
9. Wire cutter

Notes

1. The pin should be inserted into the cork along its axis with approximately 1 cm protruding as shown in Fig. 1.1.

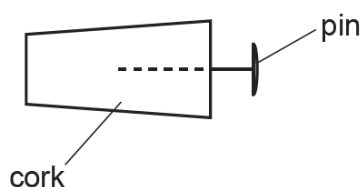


Fig. 1.1

2. The apparatus should be laid out on the bench. If the apparatus is to be used by another candidate, then it should be restored to its original state. A new piece of 16 SWG copper wire must be provided.

Materials and apparatus for Question 2 (per set of apparatus unless otherwise specified)

1. 2 x 2.0 V d.c. power supply.
2. 2 x digital multi-meters
3. 1 x 33 Ω resistor.
 - a. The markings and resistance value of the resistor should be covered.
 - b. The resistor should be labelled X.
 - c. See Note 1.
4. 3 x 68 Ω resistors.
 - a. The markings and resistance value of the resistor should be covered.
 - b. One resistor must be labelled R_A .
 - c. Another resistor must be labelled R_B .
 - d. The third resistor must be labelled R_C .
 - e. See Note 1.
5. 1 x set of connecting wires (12 wires)
 - a. 8 x both ends with crocodile clips
 - b. 4 x one end with crocodile clip and other end with jack connector
6. Switch.

Notes

1. All resistors should have a minimum power rating of 0.25 W and a tolerance of 5% (e.g. RS Components stock number 806-6499 for the 33 Ω resistor).
2. The apparatus should be laid out on the bench. If the apparatus is to be used by another candidate, then it should be dismantled and restored to its original state.

Materials and apparatus for Question 3 (per set of apparatus unless otherwise specified)

1. 2 x retort stand (with boss and clamp)
2. 1 x metre rule
3. 1 x vernier calliper
4. 3 x 100 g slotted masses
5. 1 x 50 g slotted mass
6. 1 x 100 g mass hanger
7. 3 x identical springs
8. 1 x set-square
9. 1 x metal ring

Notes

1. The apparatus should be laid out on the bench. If the apparatus is to be used by another candidate, then it should be restored to its original state.
2. The springs and ring need to be connected together.