UNITED NATIONS SCHOOL IED
PREPARATION WORKSHOP
3rd TERM
PHYSICS
GRADE 11

NOTE: The questions and answers must be copied and solved in the physics notebook as a requirement to take the competency-based test.

DUE DATE: November 6, 2024

1. **Resistivity of a wire**
   A copper wire has a length of 2 m and a cross-sectional area of 1.5 mm². The resistivity of copper is $1.68 \times 10^{-8}\ \Omega$. Calculate the resistance of the wire.

2. **Resistance of a material**
   A cylinder made of an unknown material has a length of 0.5 m and a resistance of 5 Ω. If the cross-sectional area is 0.2 cm², what is the resistivity of the material?

3. **Variation of resistance with length**
   A nickel wire has a resistance of 4 Ω when its length is 1 m. If its length is increased to 3 m while maintaining the same cross-sectional area, what will be its new resistance?

4. **Resistance as a function of area**
   A silver rod has a length of 2 m and a resistance of 0.03 Ω. If the cross-sectional area is 2 mm², calculate the resistivity of silver.

5. **Comparison of resistances**
   Two wires are made of the same material but have different lengths and cross-sectional areas. Wire 1 has a length of 1 m and a cross-sectional area of 0.5 mm², while wire 2 has a length of 2 m and a cross-sectional area of 1 mm². If wire 1 has a resistance of 2 Ω, what will be the resistance of wire 2?

6. **Resistance of an iron wire**
   An iron wire has a length of 3 m and a cross-sectional area of 2 mm². The resistivity of iron is $9.71 \times 108\ \Omega$. What is the resistance of the wire?

7. **Resistivity of an unknown material**
   A rod 1 m in length has a resistance of 8 Ω. If the cross-sectional area is 0.8 mm², calculate the resistivity of the material from which it is made.

8. **Resistance in a circuit**
   A copper wire 2 m in length has a resistance of 0.04 Ω. If the resistivity of copper is 1.68×10−8 Ω, what is the cross-sectional area of the wire?

9. **Resistance and length**
   A gold wire has a resistance of 0.25 Ω when its length is 1 m. What will its resistance be if it is stretched to 4 m while maintaining a constant cross-sectional area?

10. **Resistance of a tungsten filament**
    A tungsten filament in a light bulb has a length of 0.3 m and a cross-sectional area of 1.5×10−6 m². If the resistivity of tungsten is 5.6×10−8 Ω, what is the resistance of the filament?

11. **Resistance of an aluminum wire**
    An aluminum wire 10 m in length has a resistance of 0.5 Ω. If the cross-sectional area of the wire is 1.2 mm², what is the resistivity of aluminum?

12. **Parallel resistance of two wires**
    Two copper wires of equal length with resistances of 3 Ω and 5 Ω are connected in parallel. What is the equivalent resistance?

13. **Resistance and variation of area**
    A wire has a resistance of 1.5 Ω when its cross-sectional area is 2 mm². If the cross-sectional area is increased to 4 mm² while maintaining the same length and material, what will be the new resistance?

14. **Comparison of resistivities**
    A wire 1 m in length made of material A has a resistance of 10 Ω, while a wire of the same length and cross-sectional area made of material B has a resistance of 5 Ω. What is the ratio of the resistivities of the two materials?

15. **Resistivity of a steel wire**
    A steel wire has a length of 4 m and a cross-sectional area of 1.8 mm². The resistivity of steel is 1.5×10−7 Ω. Calculate the resistance of the wire.

16. **Resistance of a copper wire**
    A copper wire has a length of 5 m and a resistance of 1.2 Ω. If the resistivity of copper is 1.68×10−8 Ω, what is the cross-sectional area of the wire?

17. **Resistance of a nichrome wire**
    A nichrome wire has a cross-sectional area of 0.3 mm² and a length of 1.5 m. The resistivity of nichrome is 1.10×10−6 Ω. What is the resistance of the wire?

18. **Effect of doubling length on resistance**
    A wire has a resistance of 6 Ω and a length of 2 m. If the length is doubled while keeping the same cross-sectional area, what will be the new resistance?

19. **Resistance of a wire in series**
    Three wires, each with a resistance of 2 Ω, 4 Ω, and 6 Ω, are connected in series. What is the total resistance of the circuit?

20. **Parallel resistance of three wires**
    Three wires with resistances of 8 Ω, 12 Ω, and 24 Ω are connected in parallel. What is the equivalent resistance?

21. **Resistance of a carbon rod**
    A carbon rod has a length of 1 m and a resistance of 15 Ω. If the cross-sectional area of the rod is 0.5 mm², what is the resistivity of carbon?

22. **Effect of reducing cross-sectional area on resistance**
    A wire has a resistance of 0.8 Ω when its cross-sectional area is 3 mm². If the cross-sectional area is reduced to 1.5 mm², what will be the new resistance, assuming the same length and material?

23. **Resistivity of brass**
    A brass wire with a length of 2 m has a resistance of 0.25 Ω. If the cross-sectional area is 1.2 mm², calculate the resistivity of brass.

24. **Resistance and temperature effect**
    A copper wire has a resistance of 10 Ω at 20°C. If the temperature increases to 100°C, and assuming a temperature coefficient of resistance of 0.004/°C for copper, what is the new resistance of the wire?

25. **Resistance of a gold wire**
    A gold wire is 0.75 m long and has a cross-sectional area of 0.4 mm². If the resistivity of gold is 2.44×10^{-8} Ω, calculate the resistance of the wire.

26. **Resistance of a coiled wire**
    A coil of wire has a total length of 100 m and a cross-sectional area of 0.5 mm². If the resistivity of the material is 1.5×10^{-7} Ω, what is the resistance of the coiled wire?

27. **Resistance of a platinum wire**
A platinum wire has a length of 2.5 m and a resistance of 0.45 Ω. If the cross-sectional area of the wire is 0.35 mm², calculate the resistivity of platinum.

28. **Comparison of copper and aluminum resistances**
A copper wire has a resistance of 3 Ω and a length of 1 m. An aluminum wire with the same length and cross-sectional area has a resistance of 4.5 Ω. What is the ratio of the resistivities of aluminum to copper?

29. **Resistance of a zinc rod**
A zinc rod has a resistance of 6.2 Ω and a cross-sectional area of 0.7 mm². If the resistivity of zinc is 5.9×10^{-8} Ω, what is the length of the rod?