Assignment 9

Due on 2028-04-01, 23:59 IST.

Unit 11 - Week 9

Course outline

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Assignment 9

1. Which of the following is the correct expression of Ohm’s law for a resistor?
   a. $V = IR$
   b. $I = V/R$
   c. $R = V/I$
   d. $I = VR$

2. Which of the following elements is NOT a semiconductor?
   a. Iron
   b. Germanium
   c. Silicon
   d. Copper

3. Complete the circuit below with a battery and a bulb to create a complete circuit.

4. A student measures the temperature of a substance at 50°C and finds the temperature of the same substance at 0°C. The change in temperature is 50°C.

5. A certain gas is compressed from 2 L to 1 L at constant temperature. What is the work done?

6. A parallel plate capacitor has a capacitance of 100 µF. The distance between the plates is 1 mm. What is the electric field between the plates?

7. A U-tube contains two different liquids with densities of 0.9 g/cm³ and 1.2 g/cm³. A piece of wood floats on the 0.9 g/cm³ liquid and sinks in the 1.2 g/cm³ liquid. What is the buoyant force on the wood?

8. A closed container contains helium gas at a pressure of 1 atm and a temperature of 27°C. The container is then heated to 54°C. Assuming no change in volume, what is the final pressure in the container?

9. A piston compresses a gas in a cylinder from an initial volume of 0.1 m³ to a final volume of 0.05 m³. The pressure increases from 2 atm to 4 atm. What is the work done by the gas?

10. A proton and an electron are moving in the same direction in a uniform magnetic field. What is the force on each particle?

11. A block is hanging at rest in a gravitational field. What is the force acting on the block?

12. A charged particle moves in a uniform electric field. What is the force on the particle?

13. A charged particle moves in a uniform electric field. What is the acceleration of the particle?

14. A charged particle moves in a uniform electric field. What is the potential energy of the particle?

15. A charged particle moves in a uniform electric field. What is the work done by the electric field on the particle?

16. A charged particle moves in a uniform electric field. What is the force on the particle?

17. A charged particle moves in a uniform electric field. What is the potential energy of the particle?

18. A charged particle moves in a uniform electric field. What is the work done by the electric field on the particle?

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29. A charged particle moves in a uniform electric field. What is the potential energy of the particle?

30. A charged particle moves in a uniform electric field. What is the work done by the electric field on the particle?