**Assignment 1- Physics SPL2172**

1. Define a physical quantity and distinguish between fundamental and derived quantities with examples.
2. Use dimension analysis to check the correctness of the equation s=ut +1/2at2
3. Explain the significance of the SI system of units and list its seven base units.
4. Derive the dimensional formula for force and energy using fundamental quantities.
5. Explain the application of dimensional analysis in verifying equations
6. A current of 5 A flows through a conductor for 2 minutes. Calculate the total charge that has passed through the conductor.
7. A resistor of 10Ω is connected across a 12V battery. Find the current flowing through the resistor
8. A 60 W bulb is operated on a 220 V supply. Find the current flowing through it.
9. A heating coil has a resistance of 50Ω. How much power does it consume when connected to a 110V source?
10. A 10Ω resistor carries a current of 3 A for 10 minutes. How much energy is dissipated as heat?
11. A solenoid with 500 turns carries a current of 2 A and has a length of 0.5 m. If the permeability of free space is 4π×10−74H/m, calculate the magnetic field inside the solenoid?
12. An alternating current of peak value 5 A is flowing through a circuit. Find the RMS value of the current.
13. Explain Coulomb’s Law and its significance in electrostatics.
14. Calculate the electrostatic force between two charges of +6µC and -2µC separated by 0.3m in vacuum.
15. A charge of 4µC is placed in an electric field of 2000 N/C. Determine the force experienced by the charge.
16. A charge of 5µC is placed 0.2m away from a charge of -3µC. Determine the electric potential energy of the system.
17. Discuss the applications of electrostatics in everyday life.
18. State and explain Faraday’s laws of electrolysis.
19. A current of 4A flows through an electrolyte for 20 minutes. If the electrochemical equivalent of the substance is 0.0005 g/C, determine the mass deposited
20. How much power flows in the filament of a 60-W bulb connected to the 120V power line?