Practical No: 02

Title: Develop a digital taxi meter using AVR microcontroller.

Introduction:

In this practical, it is aimed to design a prototype of a digital taxi meter using the Atmel AVR microcontroller. The system needs to calculate speed and distance travelled by the taxi's wheel and continuously displays it on a display.

Figure 01: Front panel of the meter.

Task 01: Measuring RPM (rotations per minute) using the Hall sensors.

- Design a circuit by using given sensors to detect the speed (rpm) of a rotating wheel.
- Write a C/C++ program for an ATmega328P microcontroller to calculate the speed of the wheel using the above circuit and display on 4 SSDs.
- Extend the developed program to calculate the speed of the wheel in standard kmh^{-1} and travelled distance.
- Add two push buttons to the circuit which will use as Start and Stop travel buttons on the front panel. Modify the program to calculate travelled distance and cost by incorporating the button inputs.

Task 02: Add wireless capability to the system.

- Write a C/C++ program for an ATmega328P microcontroller to communicate with PC through the RS232 interface.
- Modify the program to use the HC-05 Bluetooth module with the microcontroller.
- Extend the program to send the travel cost to the PC via Bluetooth when the Stop travel button is pushed.
- On the PC side, developed a software interface to store the fares received and calculate the total at the end of the day.