Birla Institute of Technology and Science, Pilani

COURSE TITLE:

Microprocessor Programming and Interfacing

DESIGN ASSIGNMENT

CHOCOLATE VENDING MACHINE

Group Number: 66 Project Number: 18

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System: Chocolate Vending Machine

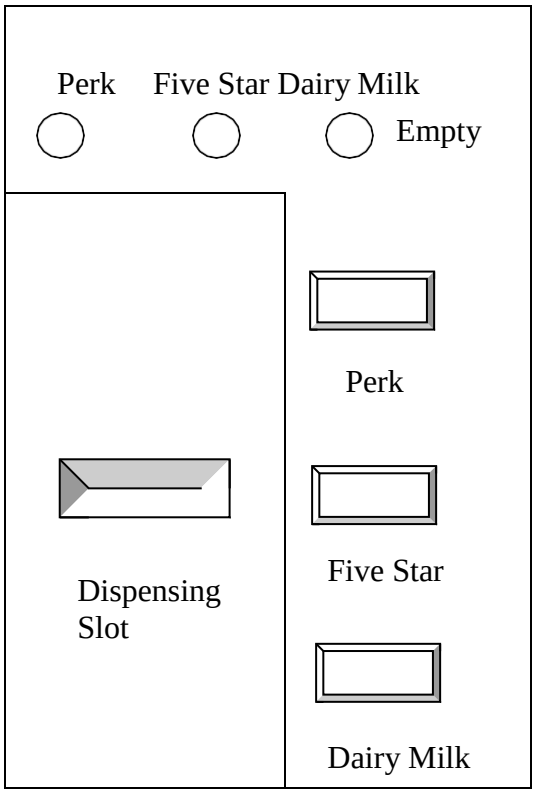
Description: This automatic machine vends three different types of chocolates.

Perk - Rs. 5.00

Five-Star - Rs10

Dairy Milk - Rs20.

The currency has to be given in terms of 5 Rupee coins. A weight sensor is used to detect whether the coin is an Rs5 coin or not. There are three buttons available for the selection of the chocolate. After the chocolate has been selected user has to put the correct currency into the coin slot. When the user has dropped the entire amount into the slot, the machine dispenses the correct chocolate. LED's are used as indicators to show if any of the chocolates being vended are not available.



Assumptions

1. A total of 10 chocolates of each type are present in the machine initially.
2. The machine will dispense only one chocolate at a time.
3. The user will put the amount within 2 minutes of pressing the button.
4. The chocolate will be dispensed only if the amount put is equal to or more than the price of the chocolate. If the user puts in less money no chocolates will be dispensed and the user will not get the money back. If the user puts in more money the chocolate will be dispensed and the extra money will not be returned.
5. If the LED, indicating that the chocolate is not available in the machine, is glowing it is up to the user not to put his money in as the machine will turn the motor even if the machine is empty.
6. The pressure of each Rs.5 coin is 0.04kPa.
7. The pressure sensor is already loaded with an offset pressure of 3kPa.

ICs Used

1. Intel 8086 - Microprocessor
2. 2716 - 2K ROM
3. 6116 - 2K RAM
4. 74LS244 - Octal Buffer/Line Driver
5. 74LS138 - 3 to 8 line De-Multiplexer/Decoder
6. 74HS373 - Octal D-type Latch
7. 74LS245 - Octal Bus Transceiver
8. 74HC32 - 2 Input OR Gate
9. 74HC04 - Inverter
10. L293D - Motor Driver IC
11. LTC1099 - 8-bit ADC
12. 74HC4078 - 8-Input NOR Gate
13. 8255A - Programmable Peripheral Device
14. 8284 - Clock Generator
15. MPX5010 - Pressure Sensor

-Miscellaneous Components

1. LEDs
2. 100 Ohm Resistor
3. 10k Ohm Resistor
4. SPST Push Button
5. Capacitor 10u F