**Scenario**

You are working as a supervisor in an electronics company working in the field of designing and building electronics systems and solutions. Your manager asked you to work on some customer's requests to select the proper integrated circuit and prepare initial design for their needs.

**Task 1:**

Customer needs:

1. It is required to **buffer** 6 leds as indicators.
2. It is required to use **line driver** to interface the computer parallel port with 7 segment unit.
3. It is required to use **3** output pins only from a microcontroller to **select** one from **8** applications (you may use 8 leds to simulate the applications).
4. It is required to **decode** **BCD** output from a microcontroller to **7 segment** unit.
5. It is required to **multiplex 4 inputs to one output only:**

**Inputs are:**

* Clock signal.
* Logic 0.
* Logic 1.
* Logic 0.

1. It is required to **store** and **retrieve** 4 byte codes as an encoder like table (1) below.

|  |  |
| --- | --- |
| **Input** | **output** |
| 00000000 | 01010101 |
| 00000001 | 00001111 |
| 00000010 | 11110000 |
| 00000011 | 11001100 |

1. It is required to use a **programmable logic device** to implement BCD to 7 Segment Decoder.

**Note:**

1. **Use logic input from switches instead of microcontroller or computer parallel port.**
2. **You assessor will choose 2 requests to work on.**

1. **Interpret manufacturers' data sheets to select the appropriate combinational logic device for 2 of the customers' requests.**

**Put your selection and datasheet interpretation into the following table for each purpose.**

|  |  |
| --- | --- |
| **IC number** |  |
| **Function** |  |
| **Description** |  |
| **Applications** |  |
| **Manufacturing Technology** |  |
| **Cost** |  |
| **Size** |  |
| **Packaging** |  |
| **Operating Voltage** |  |
| **Availability** |  |
| **Fan out or ( output and Input Currents)** |  |
| **Power Consumption** |  |

**Table (1)**

**P1.1**

1. **For the two designs you are developing if you have selected an IC manufactured with certain technology (i.e. TTL or CMOS), now you have to use table 1 again to compare the characteristics of similar devices using the other technology.**

**P1.2**

1. **Design and construct and test your solutions using the selected combinational ICs.**

**P1.3**

1. **Use computer software package to simulate your solution.**

**P1.4**