Experiment 2: Four-input Combinational Logic
Time: 1 day

a) Glow one LED by connecting power supply [External] (use current limiting resistors in series with LED).
Glow four LEDs through IC 74245 (use current limiting resistors in series with LED).

b) Blink 4 LEDs sequentially with OFF time and ON time each of 1 second.
Note: *Connect 8051 ports (J6 / J10) of microcontroller Kit to 26-pin connector on the breadboard by the 26-pin FRC. Find out the* ***GROUND*** *of the 8051 port from the PIN details of connector (j6 / j10) and locate the GROUND pin on the breadboard.* ***GROUND of 8051 port and GROUND of External power supply must be connected together.***

c) The truth-table of a four-input combinational logic with inputs A(MSB), B, C, D(LSB) is stored at locations 9000H to 900FH. Each location stores either a 0 or a 1 to represent whether the corresponding entry is FALSE or TRUE. For example, the location 9003H will be 1 if the term A'B'CD is present in the function, 0 otherwise. Design a circuit that uses four LEDs to represent the inputs A, B, C, D and another LED (may be different colour) to represent the function output. Once the program initiated it will continually glow the LEDs in a cycle to show the input combinations 0000 to 1111 and the corresponding output. Put sufficient delay so that the LEDs are visible. Now interface an LDR. If the LDR is covered, it should blink all the five LEDs. Once the cover is removed, the operation comes back to its normal mode starting at combination 0000. Change the content of truth-table to see that your module is working properly.

Points to note:

- Learn about port programming of 8051.
- Use 8051 ports (J6 / J10) to drive the LEDs.
- Ensure that LEDs are connected via series resistors.
- Learn about LDR interfacing.