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Branch: CSE

Section/Group: 23 “ B”

Subject Name:Digital Electronics

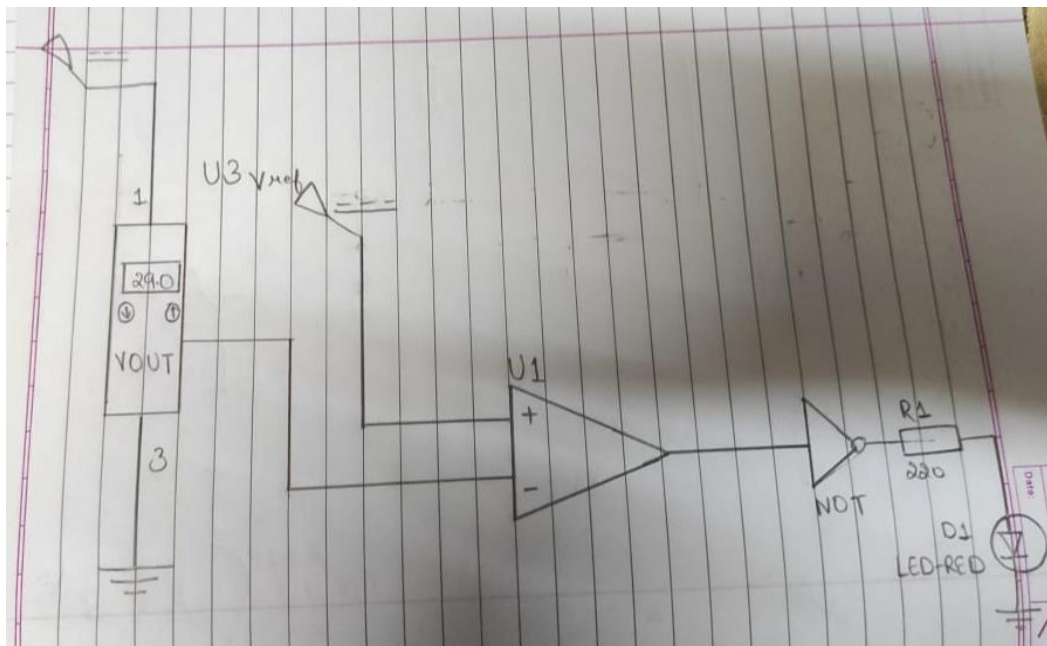
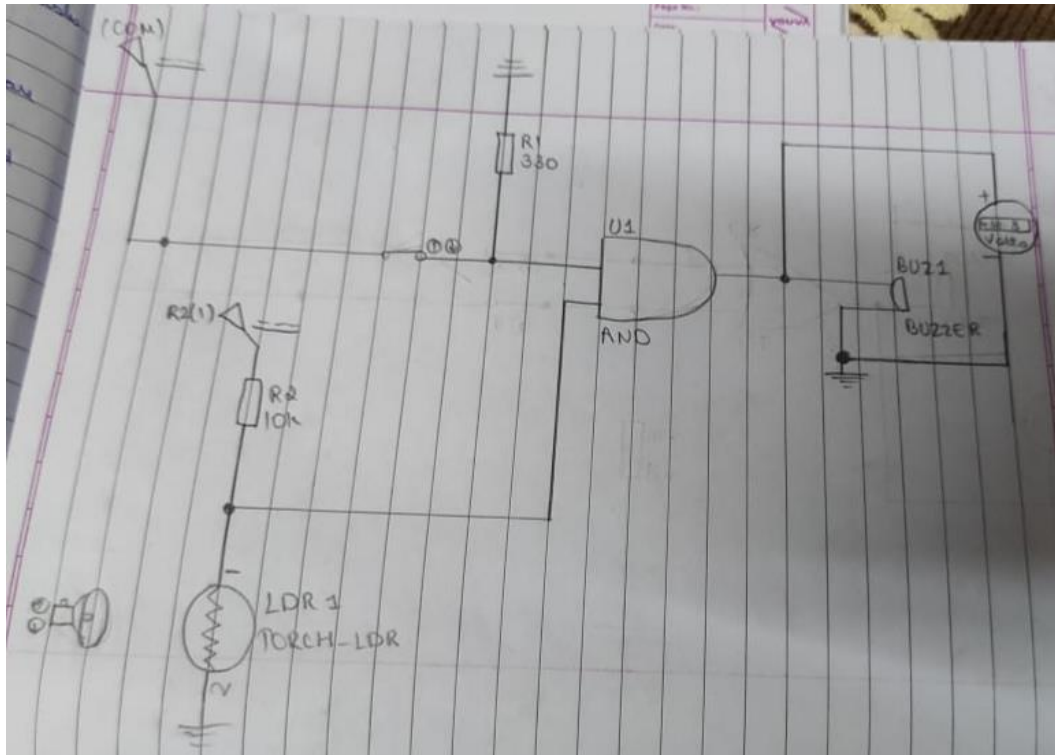
Task to be done :-

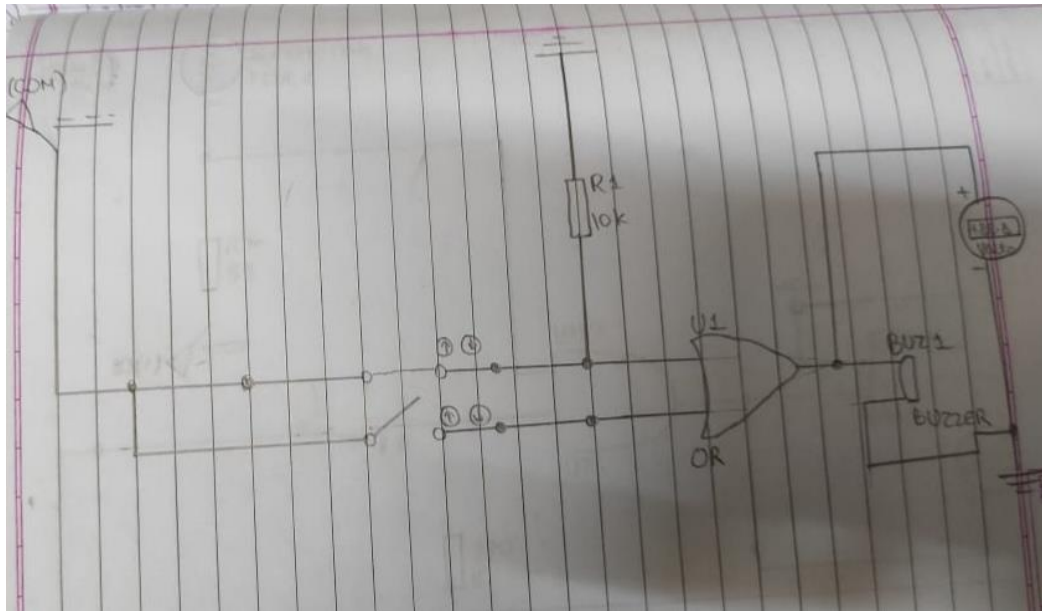
- (a) Design a burglar alarm (AND).
- (b) Design a single doorbell ringer for both front and back doors (OR).
- (c) Design an automatic fan controller (NOT).

Requirements :-

- (a) 7404 (NOT) IC
- (b) 7408 (AND) IC
- (c) 7432 (OR) IC
- (d) 5V Power Supply
- (e) Breadboard
- (f) Connecting wires
- (g) Simulation software
- (h) Windows 10 PC

Circuit diagram/ Block diagram :-



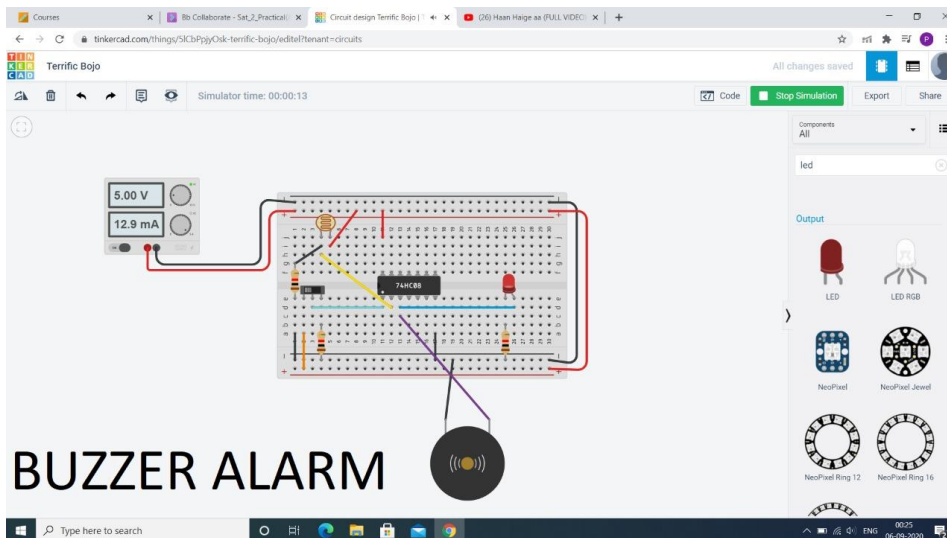


Simulation Results :-

1. In case of alarm clock :-

(a) When light is not falling on LDR buzzer doesnot sound.

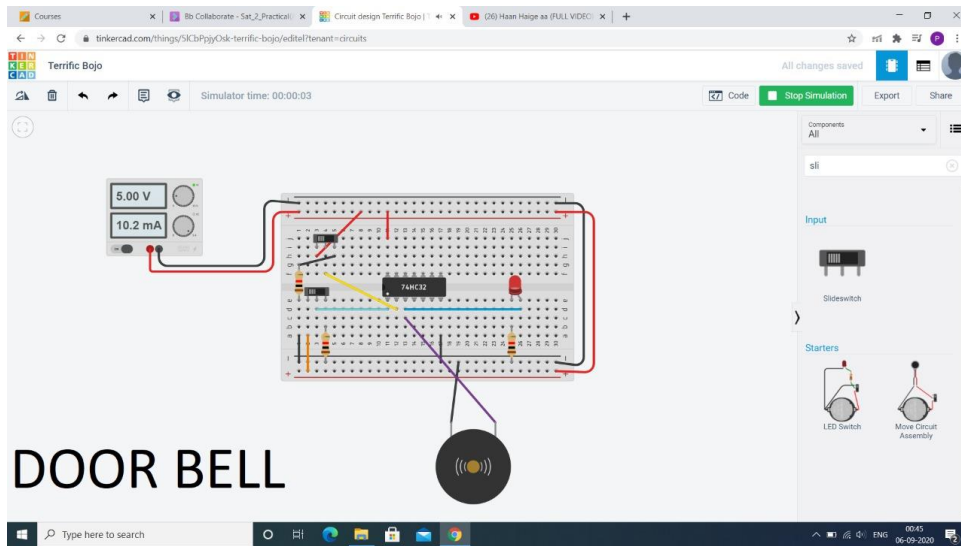
(b) When light is falling on LDR buzzer sounds.



2. In case of doorbell :-

(a) When both the doorbell switches are closed then buzzer doesnot sound.

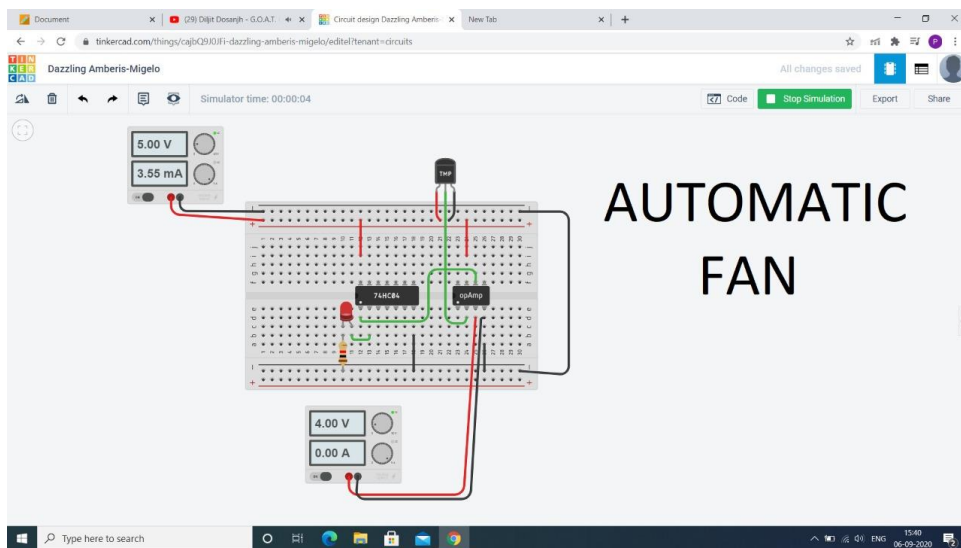
(b) When one of the doorbell switches is opened then buzzer sounds.



3. In case of automatic fan controller :-

(a) When the temperature is below 30 degree celsius then the fan controller doesnot work.

(b) When the temperature is above 30 degree celsius then the fan controller works.



Concept used :-

Integrated circuits also called chips are specialized circuits. Many ICs are come in dual line package. There are three types of ICs are used (7408 IC, 7432 IC, 7404 IC).

AND Gates(7408 IC) are available in IC packages. It is a well known QUAD 2-input AND Gates IC and contains four important gates each of which perform the logic AND function. AND gate gives output 1(ON State) when both the inputs are 1 means in ON State. In case of the burglar alarm the alarm switch which is a toggle switch and the person detection is achieved by the light falling on the sensor made from LDR is used.

OR Gates(7432 IC) are available in IC packages. It is a well known QUAD 2-input OR Gates IC and contains four independent gates each of which performs logic OR function. OR gate gives output 1(ON State) either one or more of the input is 1 means in ON State.

NOT Gates(7404 IC) has 6 NOT Gates. It is the most basic of all the gates. Also called inverting buffer or inverter. It is required to control the central heating to turn on/off according to the temperature threshold.

Learning/ observation :-

1. In case of the burglar alarm when the alarm switch is ON and the LDR sensor detects a light only then the alarm will ring otherwise it will not ring in any of the other cases.

2. In case of the doorbell, doorbell should ring when someone presses either the front door switch or the back door switch.

3. In case of automatic fan controller if the temperature is above 30 degrees celsius then the fan will be automatically switched ON and if the temperature is below 30 degree celsius then the fan will be automatically switched off.

Troubleshooting :-

Problem occurred during the experiment is that on high voltage IC was bursted then I added resistor in it which prevents IC to get blast.