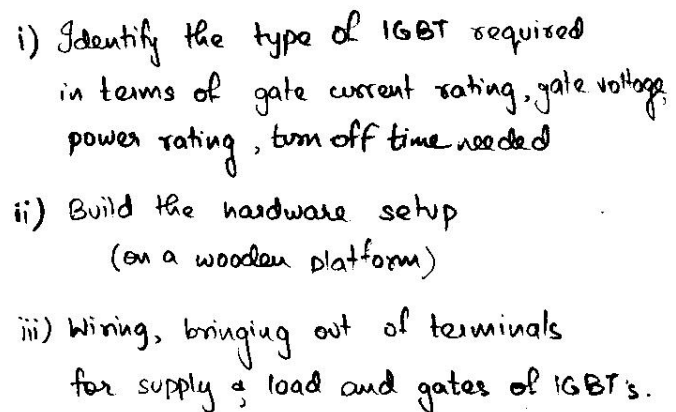
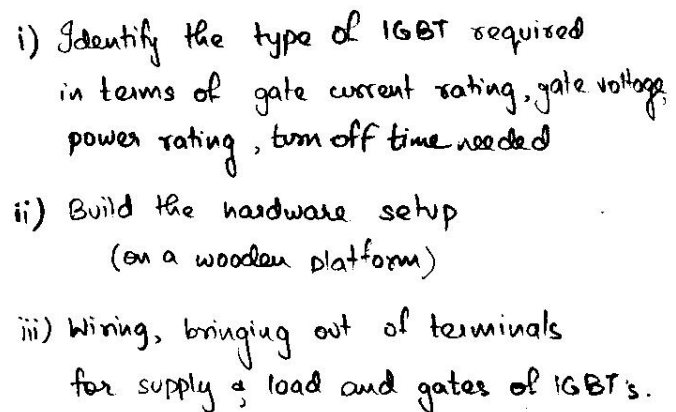


## SINGLE PHASE SQUARE WAVE INVERTER

### Requirements of the batch



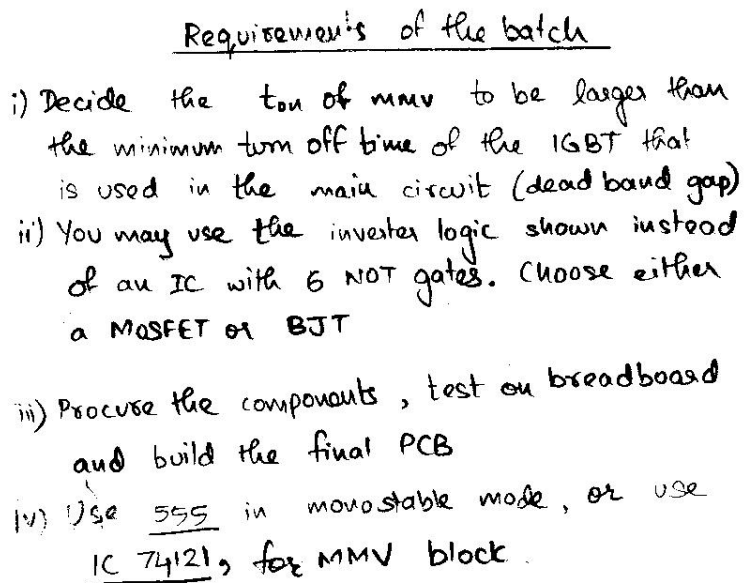
- i) Identify the type of IGBT required in terms of gate current rating, gate voltage, power rating, turn off time needed
- ii) Build the hardware setup (on a wooden platform)
- iii) Wiring, bringing out of terminals for supply, load and gates of IGBT's.



MMV: monostable multivibrator

LT: level translator (clips the -ve half)

$T_1$ : low power (230:6) V transformer

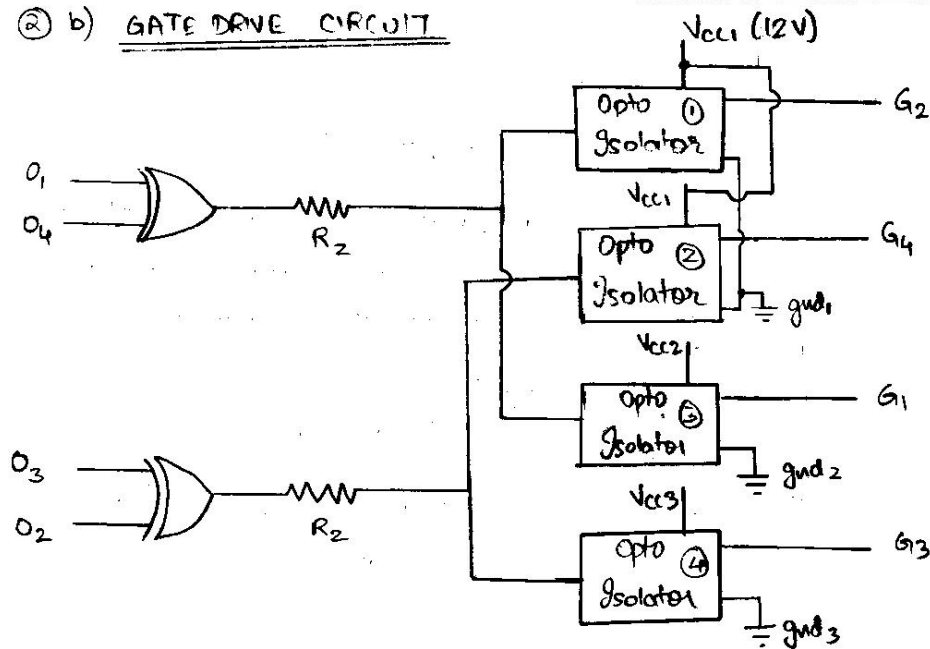


- i) Decide the  $t_{on}$  of  $muv$  to be larger than the minimum turn off time of the IGBT that is used in the main circuit (dead band gap)
- ii) You may use the inverter logic shown instead of an IC with 6 NOT gates. Choose either a MOSFET or BJT

iii) Procure the components, test on breadboard and build the final PCB

iv) Use 555 in monostable mode, or use IC 74121, for MMV block.

## ② b) GATE DRIVE CIRCUIT



$R_2$ : current limiting resistance

### Requirements of batch

- i) You may use MCT2E for opto isolation
- ii) Build Firing circuit and Gate drive circuit on the same PCB

## ③ POWER SUPPLY CIRCUIT

### i) To opto isolator in Gate Drive Circuit

Use 230V ac supply from socket with bridge rectifier, filter, regulator:

- a) 12V, gnd  $\rightarrow$  higher rating of transformer <sup>(1A)</sup> to drive IGBT<sub>2</sub> + IGBT<sub>4</sub>
  - b) 12V, gnd  $\rightarrow$  normal rating <sup>(500mA)</sup> to drive IGBT<sub>1</sub>
  - c) 12V, gnd  $\rightarrow$  normal rating <sup>(500mA)</sup> to drive IGBT<sub>3</sub>
- $\rightarrow$  build 3 independent circuits (for isolation)

### ii) To firing circuit

- a) op-amp - +15V, -15V from DC RPS
  - b) Inverter - +15V, gnd from DC RPS
  - c) MMV - +15V, gnd from DC RPS
- } taken directly

- iii) Build the power supply on a GPB (general purpose board) of appropriate size.