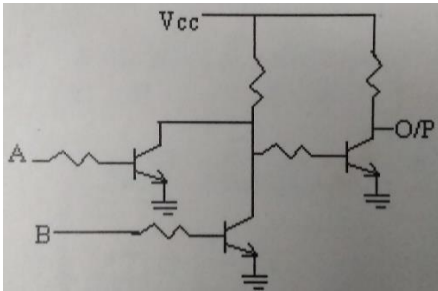


LEVEL 2

30marks

1. Recognize the TTL logic circuit as AND/NAND/OR/NOR/XOR/XNOR.



(2 marks)

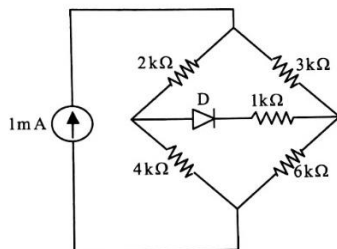
Ans: OR gate

2. Raju, Farhan and Rancho working alone can complete a work in 6,8, and 10 hours respectively. All the three of them start working together. After 2 hours of working Raju has a fight with Rancho and he leaves the work and goes away. The remaining work is finished by Farhan and Rancho. Which of the following best represents the total time taken (T) to finish the work?
- $T < 1$
 - $2.5 < T < 3$
 - $3 < T < 3.5$
 - $T > 3.5$

(2marks)

Ans:b)

3. The diode in the given circuit has $V_{ON}=0.7V$. Find the current (in mA) in the 4kohm resistor.

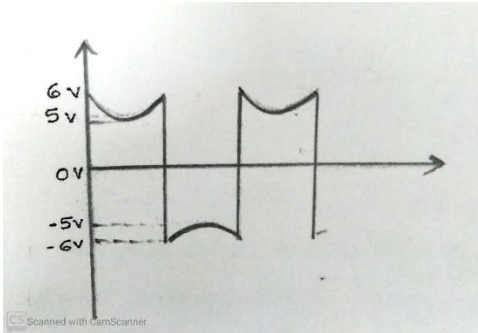


(4marks)

Ans:

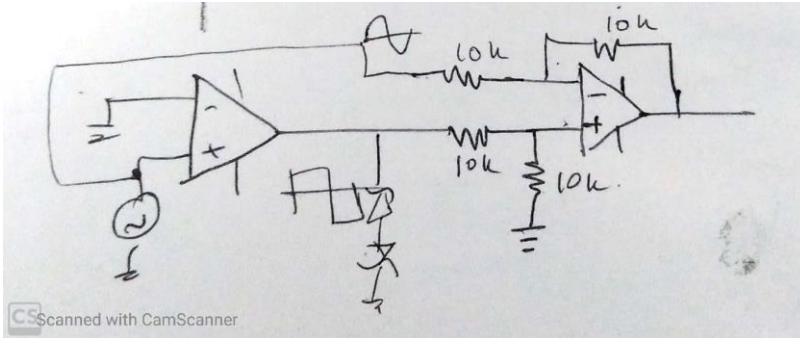
The given network is a wheatstones bridge since the ratios are the same. So diode is turned OFF due to the same potential on either ends. Hence no current flows through the horizontal branch. So, we have $(2+4)$ kohms in parallel with $(3+6)$ kohms. Current through 4k is obtained with the help of current divider rule as $I=0.6$ m A.

4. Design a circuit to obtain the following waveform from a given 2Vpp sinusoidal input.



(4 marks)

Ans:



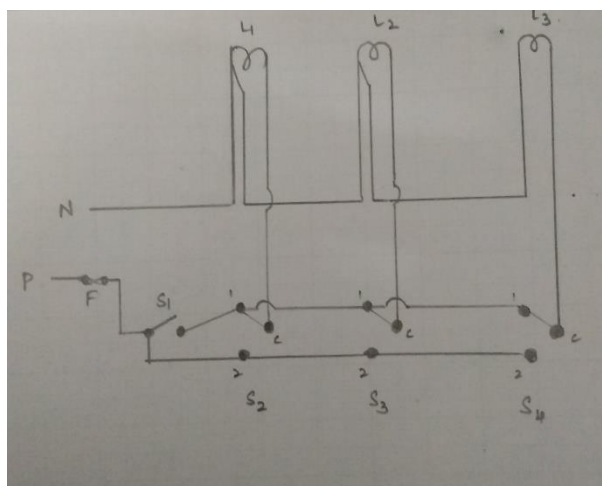
5. Draw the wiring of a circuit containing 3 lamps L1, L2, L3 such that it is possible to

- Turn off all the lamps
- Turn ON one lamp at a time
- Turn ON all the lamps

U may use maximum of 4 switches (SPST or SPDT switches may be used) and given, phase and neutral wires.

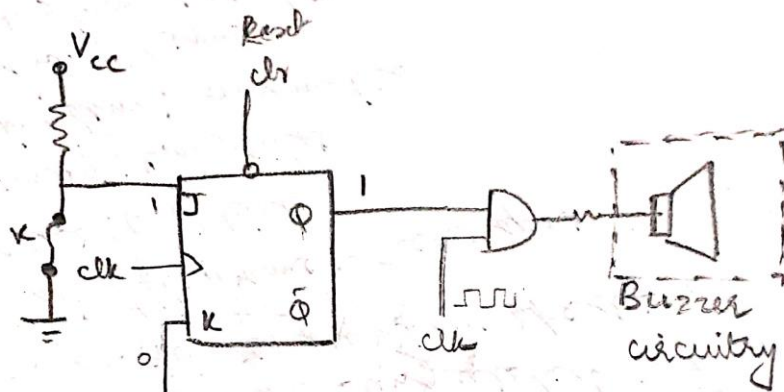
(5 marks).

Ans:



6. Design a burglar alarm system using JK flip-flop. When a burglar is sensed, the alarm should turn ON, and remain ON until the RESET button is pressed.

(6 marks)



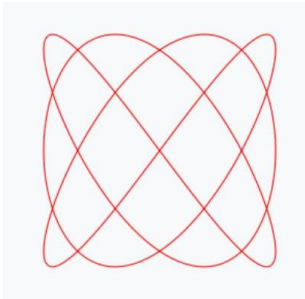
Initial state: $\begin{matrix} J & K \\ 0 & 0 \end{matrix}$

When Burglar is sensed, k gets open $\therefore J=1, K=0$

sets o/p, $Q=1$; even if k is closed back, $J=0, K=0 \Rightarrow$ same state (no change) until reset.

• Clock has to be given to Buzzer, since it needs an ac for continuous functioning.

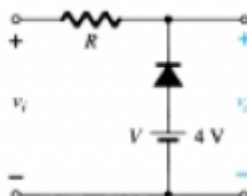
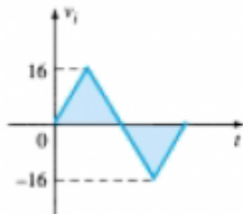
7. Suggest a method to get the pattern as in the fig, in a CRO.



(3 marks)

Ans: The ratio of frequency of y input to the x input must be 4:3.

8. For the given input waveform to the given circuit, what is the peak value of the output waveform?



- a) 0 V
 - b) 16 V
 - c) 12 V
 - d) 0 V
- (4marks)

Ans:b)