Name:- A.f.M. Rafiul Hassan

ID:- 22-47048-1

As. to the. Q. No. 1
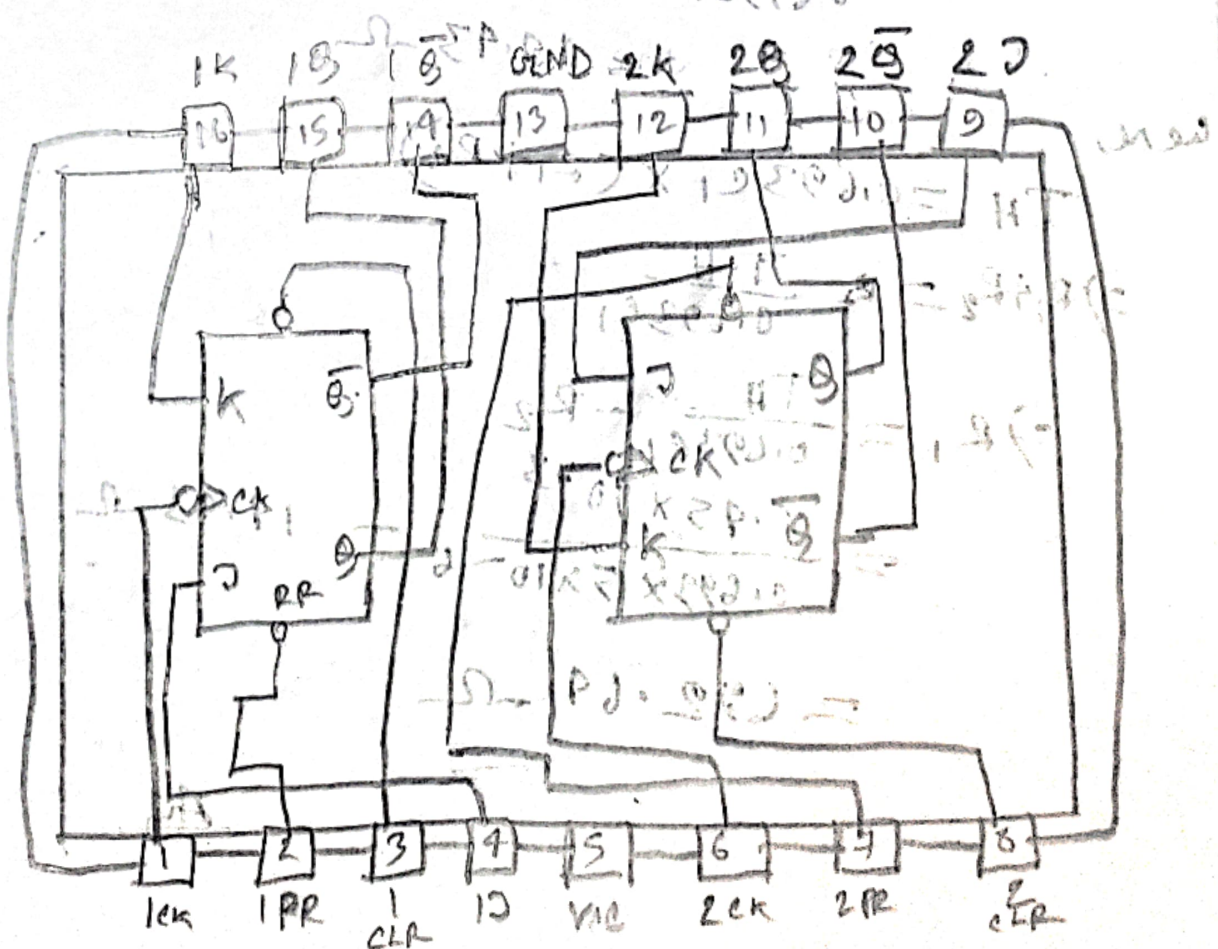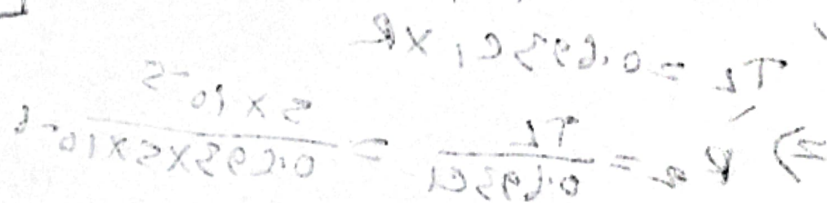

CLK ... J ... K ... Q ... Q̄

Reset=1   Reset=0   Toggle | Toggle | Toggle

Fig 1:- Pin Configuration of IC-7476

Name:- Afrim Rahul

ID;- 22-97048-1

Ans. to the Q. No. 4

here,

$f = 400 Hz$,

duty cycle $= 98\%$,
$= 0.98$

$C_1 = 5 \mu f$

The period, $T = \dfrac{1}{f} = \dfrac{1}{400} = 2.5 \times 10^{-3} s$

Time High, $T_H = 2.5 \times 10^{-3} \times 0.98 = 2.45 \times 10^{-3} s$

Time low, $T_L = 2.5 \times 10^{-3} \times 0.02 = 5 \times 10^{-5} s$

Now,

$T_L = 0.693 C_1 \times R$

$\Rightarrow R_2 = \dfrac{T_L}{0.693 C_1} = \dfrac{5 \times 10^{-5}}{0.693 \times 5 \times 10^{-6}}$

$= 14.43 \, \Omega$

here,

$T_H = 0.693 C_1 \times (R_1 + R_2)$

$\Rightarrow R_1 + R_2 = \dfrac{T_H}{0.693 C_1}$

$\Rightarrow R_1 = \dfrac{T_H}{0.693 C_1} - R_2$

$= \dfrac{2.45 \times 10^{-3}}{0.693 \times 5 \times 10^{-6}} - 14.43 \, \Omega$

$= 692.69 \, \Omega$

Ans

$$Y = A(\overline{B} + C)D + \overline{E}$$

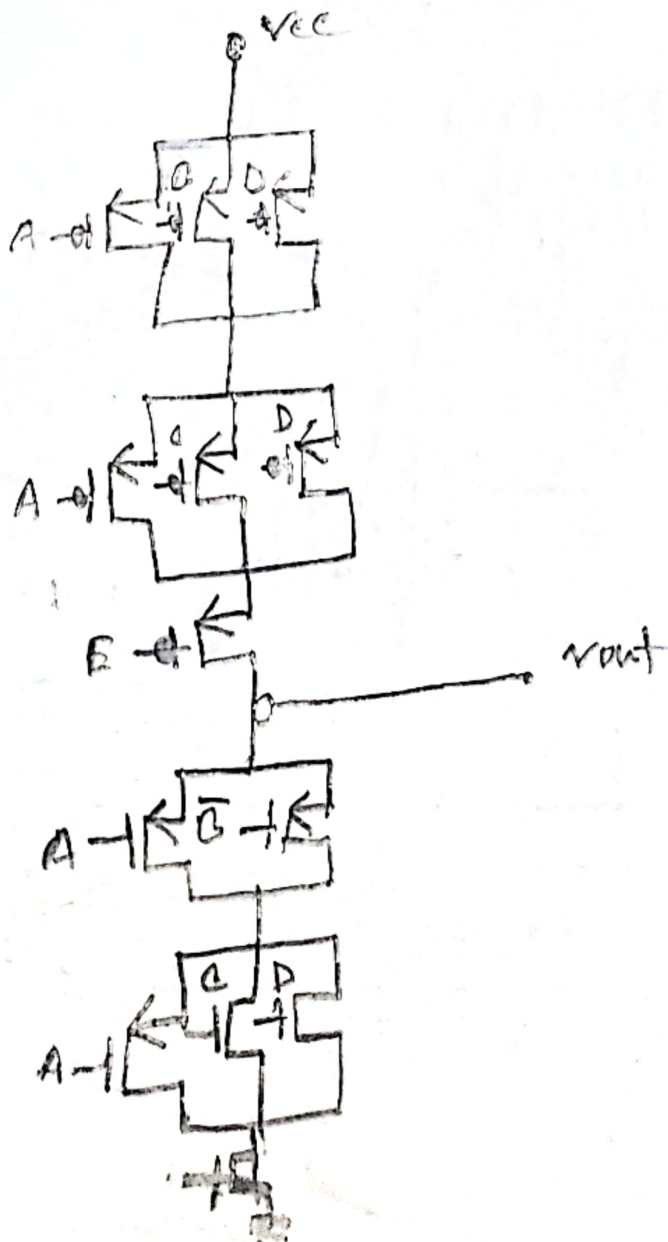NMOS $Eq^n = \overline{A(\overline{B} + C)D + \overline{E}}$

$$= \overline{A\overline{B}D + ACD + \overline{E}}$$

PMOS $Eq^n = \overline{A\overline{B}D + ACD + \overline{E}}$

$$= \overline{A\overline{B}D} \cdot \overline{ACD} \cdot \overline{\overline{E}}$$

$$= (\overline{A} + B)(\overline{A} + \overline{C} + \overline{D}) \cdot \overline{E}$$

Design:-
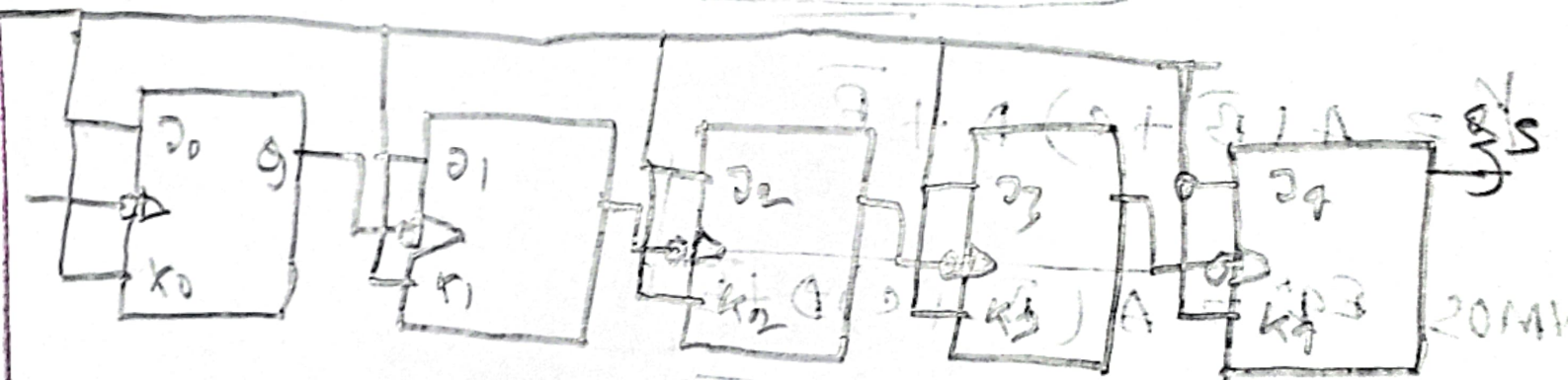
High

$$= \overline{A\overline{B}D + A\overline{C}D + E}$$

$$E_4 = A\overline{B}D + A\overline{C}D + E$$

$$= \overline{A\overline{B}D} \cdot \overline{A\overline{C}D} \cdot \overline{E}$$

$$= (\overline{A} + B + \overline{D})(\overline{A} + C + \overline{D}) \cdot \overline{E}$$

20mV

vo+8c = 5v

Input = 0101

vout = (0×5) + (1×(...)) + (...×...) + (...)

= 1.6+5.7

Given,

voltage $= 5v$
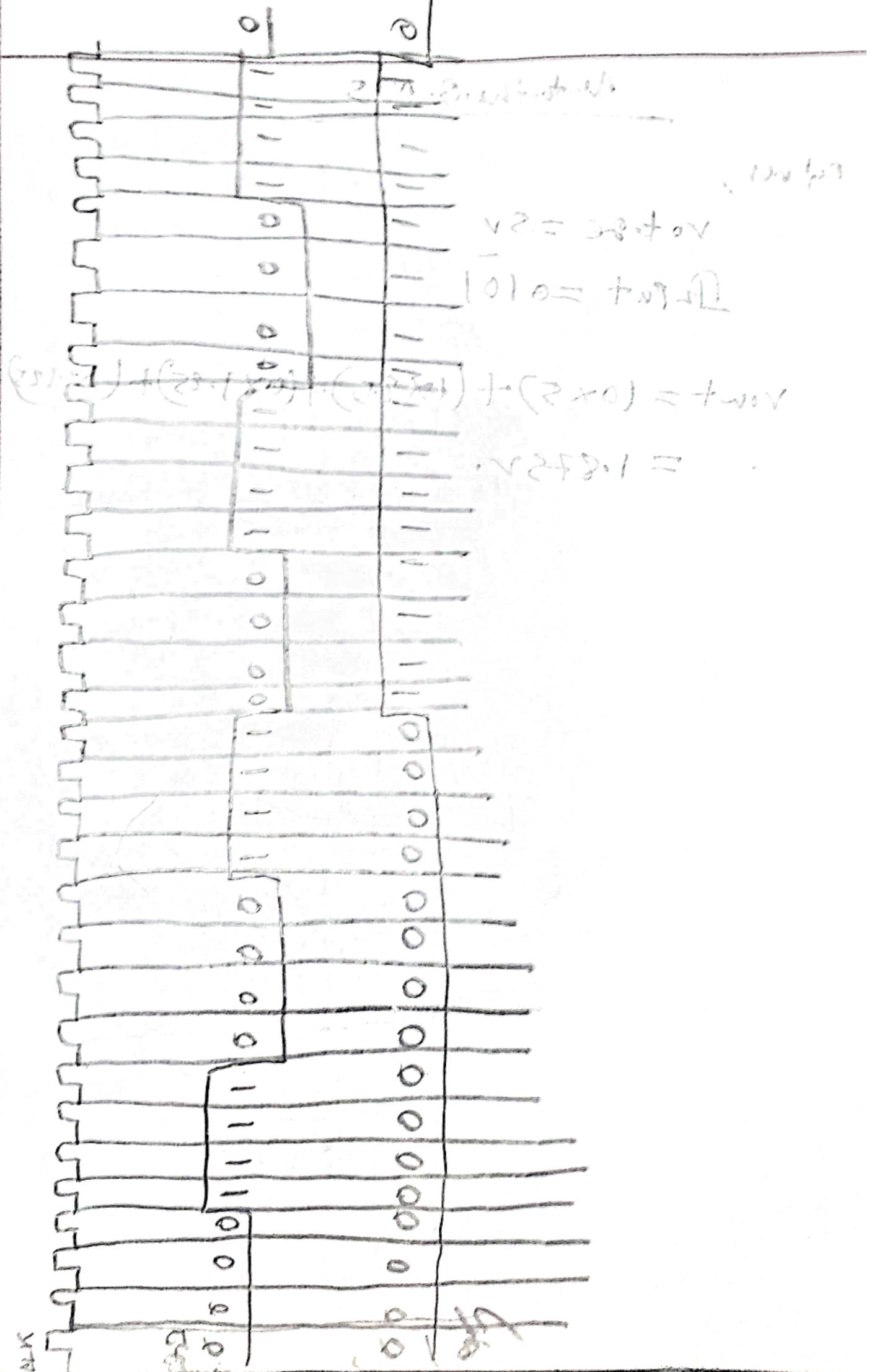
Input $= 0101$

$$v_{out} = (0 \times 5) + (1 \times 2.5) + (0 \times 1.25) + (1 \times 0.125)$$

$$= 1.875 v.$$