Q1:

Name Monsin Ali 25/8/2020
ID- 13746
electronic devices and circuit.

b)

Total Peak Secoundry Voltage.

$$V_{p(sec)} = nV_{p(Pri)}$$

$$= 0.25(250)$$

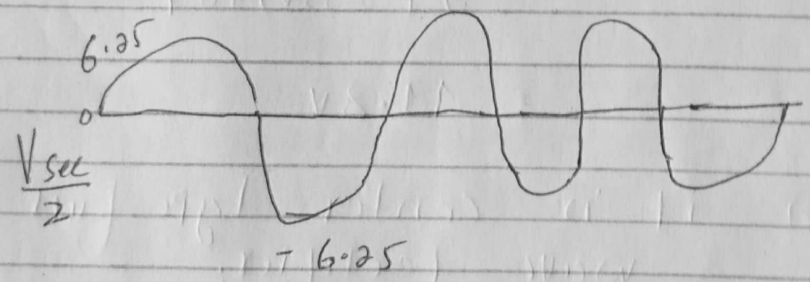
$$= 0.25(50)$$

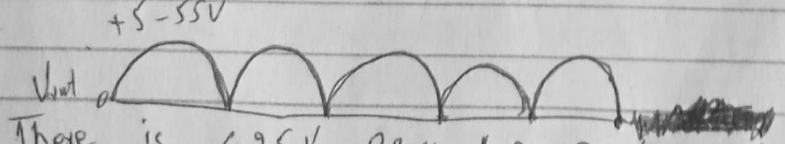
$$= 12.5\,V$$

$$V_{p(sec)} = 12.5V$$

(c)

Half of the Secoundry





There is 6.25 V Peak to Peak voltage the out put voltage has a peak value of 6.25-07 which is diod drop.

d) Peak Current Through each diode

$$I_f = \frac{V_{p(sec)}}{\frac{2}{R_L}}$$

$$= \frac{5.55V}{10K\Omega}$$

$$= 0.000555$$

$$= 0.555\ mA$$

(e) PIV rating must diode have

$$PIV = 2V_{p(out)} + 0.7$$

$$= 2(5.55V) + 0.7$$

$$= 11.8V$$

21 (a) it is center type full wave rectifier;

Q5

(a)

Power supply filters:

The ripple components of output voltage is removed by placing a filter circut The out put voltage of rectifier is Pulsating in nature. Power supply filter consist of two parts

1) Desire Dc components of voltage
2) unwanted ripple components

The unwanted components are removed by power supply filters.
In power supply cappacitors are used to filter the pulsating Dc out put So that constant Dc voltage is supplied to the load.

Filter Capacitor reduces the ripple voltage to accetable level.
In filter circut Capicator is changed to peak of rectified input voltage during possitive portion of voltage.
When input beame negative, the Cappacitors begains to discharge to load The rate of Discharg is determind by Rc Time constant.

the Cappacitance value for out put Current (I) and ripple Current (Vr

P.t.o

is

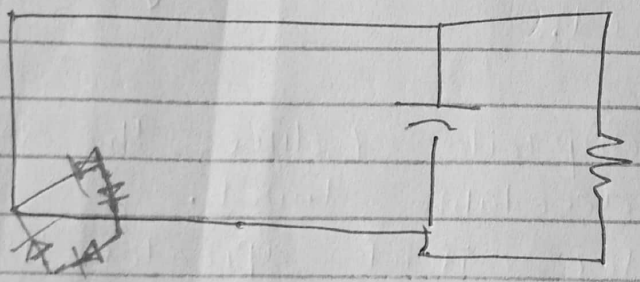
$$C = \frac{1}{V_{rms} \times 4f} \Rightarrow V_{rms} = V\left(\frac{P-P}{2}\right) \text{ for full}$$

$$\Rightarrow C = \frac{2.4f}{V_{rms}} \Rightarrow I = \text{DC load current}$$

$$C = \frac{I \times V_{dc}}{V_{rms} V_m 4} = V_{dc} = \frac{V_m + V_{P-P}}{2}$$

V_m = maximum voltage

V_{P-P} = Peak to Peak ripple voltage



filtering.

Q5 (b)

Formation of P-type and N-Type Semiconductors:

Q5: (5)

(b) The extrinsic P-type Semiconductor is formed when a Travelent Impurity is added to a pure Semiconductor in a small amount, and as a result. a larg number of holes are created in it. A larg number of holes are provided in the Semiconductor material by the addation of Trivalent Impurities like

Gallium and Indium.

N-Type:

Pentavelent Impurities atoms with 5 velence elections produce n-Type Semiconductor by Contributing extra elections.

When Semi-conductor is doped with pentavelent Impurity then N-Type Semi-conductor is formed.

Q5:

(c)

Diod limitors

Diod limitor or diod clippers is a wave shaping circuit that takes an input wave form and cuts-off its top-half bottom half or both halves together and produce wave form that resembles flattend version of the input There are Two types of Callipers.

1) Possitive Diod Limitors.

In This diod limiting circut The diod is forward Biased for The diod to became forward bias it must have the input voltage magnitude greater then +0.7 volts

A voltage bias is addedin Series with The diode.

Example.

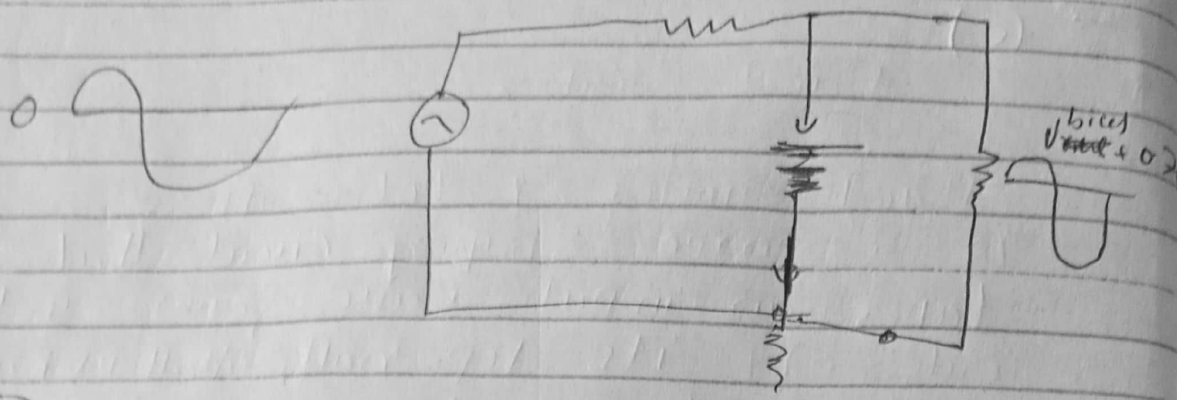
If voltage bias is set 4 volt Then the sainosodial voltage, it the diod annode terminal must be greater Then

$4 + 0.7 = 4.7V$

to be come forward bias any voltage level above is

P.t.o

(7)

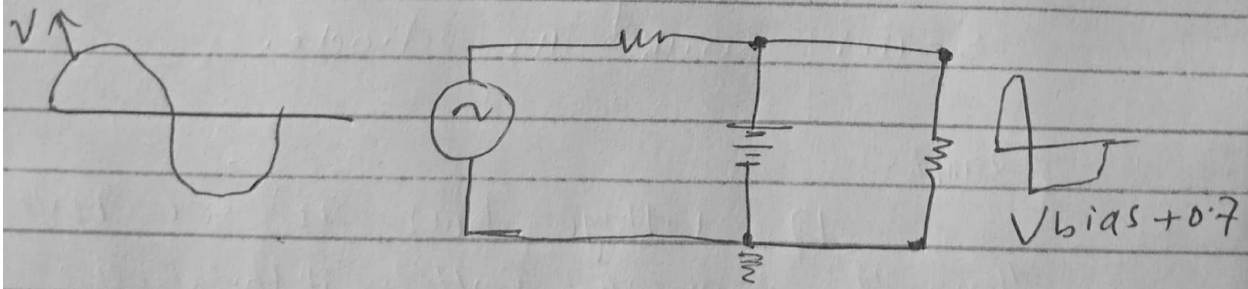


(2)

Negative Diod limitor

When the diod is forward Biased during a negative half of the cycle and limits it 0.7v while allowing the possitive half of the cycle is called negative limitors of the circuts

the out put wave form is held to a level - biase -0.7v



Negative diod limitors

Qs d)

Ans. The Capacitor effectively act as a battery in a climping circuit.

Qs (e)

Ans. The output frequency of half wave rectifier is same to input frequency,

so if 60Hz sinosiudal voltage is applied then the out put frequency will also be 60Hz.

Qs (f)

Ans. The ripple voltage and load resistance are inversly related to each other

$$\text{Ripple voltage} \propto \frac{1}{\text{load}} \text{ resistance}$$

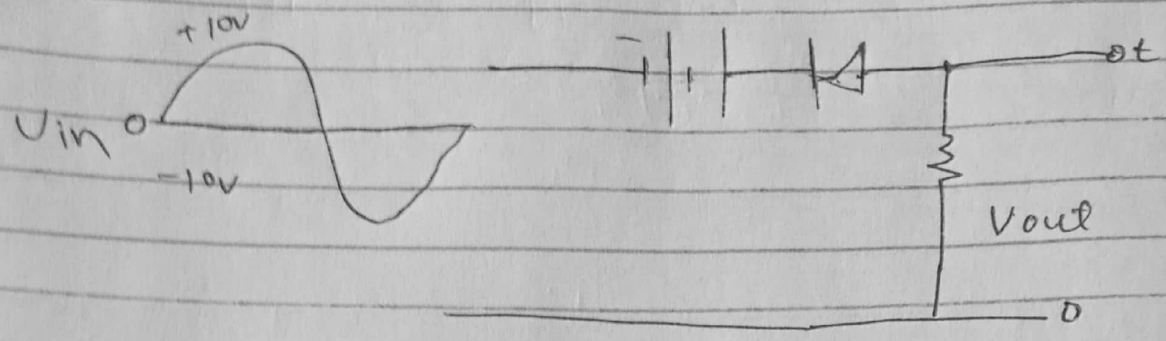
if The load resistance is decreas(↓) the applied voltag will be increas.(↑)

Q5

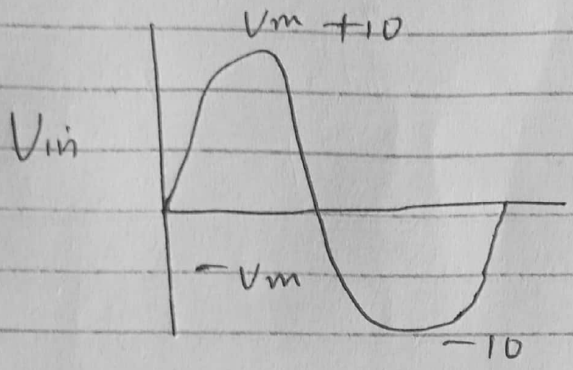
(a) Difference b/w diod limitor and diod climper.

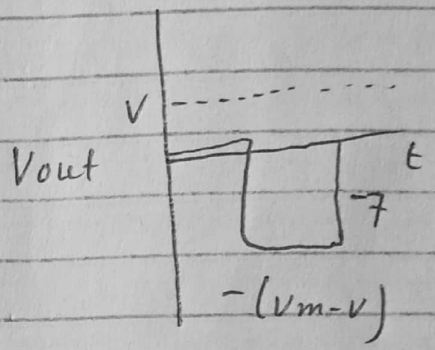
Diod limitor	Diod climper.
⇒ It limits the ~~output~~ Implitude of out put voltage	⇒ it shift the Dc level of output voltage
⇒ out put voltage less Then the Input voltage.	⇒ out put voltge is multiple then the input voltage.
⇒ the Chang of voltage Shape.	⇒ Shape remain Same
the Shape of voltage Chenge.	
⇒ if DC level remain Same.	⇒ DC level gets shift

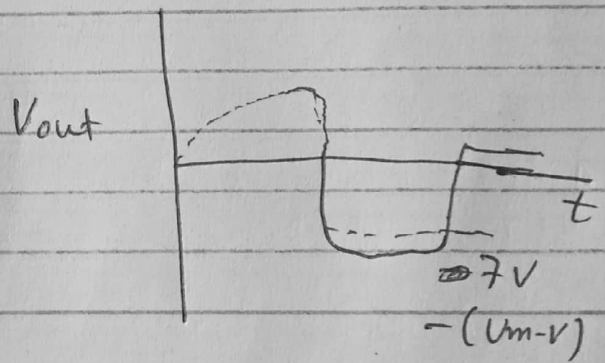
Q3:



out put wave form of clipper circuit.







Q No 2

the transfermer turn ratio is $n = 0.5$

the primary voltage is $V_{p(pri)} = 1.414\ V_{rms}$

$= 1.414\ (120) = 170\ V.$

the peak secondry voltage is

$V_{p(sec)} = n\ V_{p(pri)} = 0.5(170) = 85\ V$

The unfiltered peakfull wave rectifies voltage is

$$V_{P(rec)} = -1.4V = 85 - 1.4 = 83.6\ V$$

the frequency of a full wave rectifier voltage is 120 Hz. The approximate peak to peak ripple voltage at out put is

$$V_{r(PP)} \cong \left(\frac{1}{fRC}\right) V_{P(rect)}$$

$$= \frac{1}{120Hz\,(3.3k\Omega)\,100uf}\ 83.6V$$

$$V_{r(PP)} = 2.11V$$

the approximate dc value of the out put voltage determine as follows

$$V_{DC} = \left(1 - \frac{1}{2fRLC}\right) V_{P(rect)} \quad \cdots$$

$$= 1 - \frac{1}{(240Hz)(3.3k\Omega)(100uf)}\ 83.6$$

p.t.o

$$= \left(1 - \frac{1}{39.6}\right) 83.6$$

$$V_{DC} = 81.48V$$

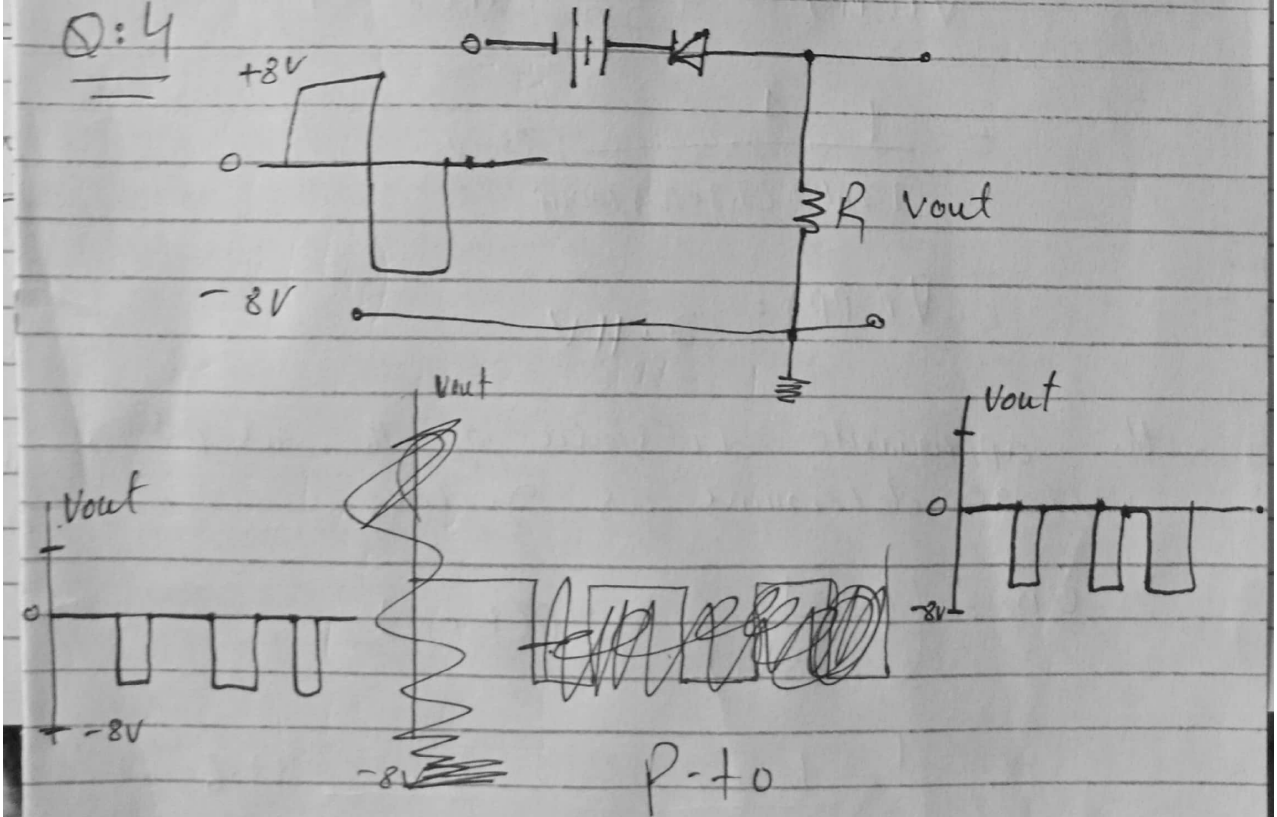
$$V_{DC} = 81.48V$$

The resulting ripple factor is

$$\gamma = \frac{V_r(PP)}{V_{DC}} = \frac{2.11}{81.48} = 0.026$$

The % ripple is $= 2.62\%$

Q:4



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