Course Details

Course Title	EDC
Module	3rd
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Student Details

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Sign	

Q1

Part (A)

What types of circuit is this?

this type of circuit is center tapped full wave rectifier

Part (B)

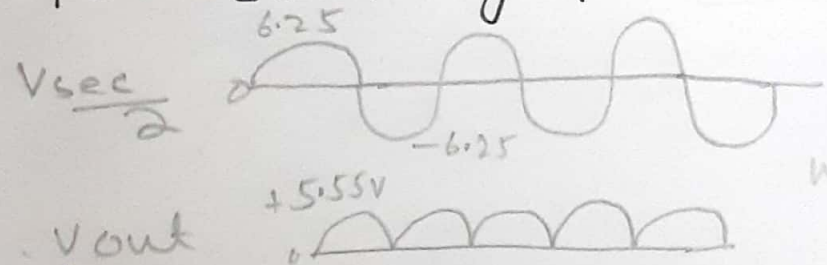
What is the total peak secondary voltage?

$V_{p(sec)} = nV_{p(Pri)} = 0.25(50) = 12.5V$

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

Part (c)

Find the voltage across each half of the secondary?



6.25 Peak to Peak voltage the output voltage has peak value 6.25 - 0.7 which is diode drop.

Part (d)

What is the peak current though each diode?

$I_F = \frac{\frac{V_{p(sec)} - 0.7}{2}}{R_L} = \frac{5.55V}{10K\Omega}$

$0.555mA$

P.

Q1

Part (E)

(a) What maximum PIV rating must the diode have?

PIV Rating must diode have

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

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

$$= 11.8\ V$$

Q2 Determine the ripple factor for the filtered ---- --- indicated in figure 2?

The transformer turns ratio $n = 0.5$

The peak primary voltage

$$V_{p(Pri)} = 1.414\, V_{rms}$$

$$= 1.414(120)$$

$$= 170\ V$$

The peak secondary voltage is

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

$$= 0.5(170) = 85\ V$$

85 V

Unfiltered peak full-wave rectified voltage is

$$V_{p(rect)} = V_{p(sec)} - 1.4$$

$$= 85 - 1.4$$

$$V_{p(rect)} = 83.6\ V$$

Frequency of a full-wave rectified voltage is 120 Hz. The approximate peak to peak ripple voltage at the output is

$$V_{r(PP)} = \left(\frac{1}{fR_L C}\right) V_{p(rect)}$$

$$= \left(\frac{1}{(120\,Hz)(3300\Omega)(100\times10^{-6}F)} \right) \cdot 83.6\,V$$

$$V_{r(PP)} = 2.111\,V$$

Approximate dc value of the output voltage is determine as follow

$$V_{DC} = \left(1 - \frac{1}{2fR_LC}\right) V_{p(rect)}$$

$$V_{DC} = \left(1 - \frac{1}{(240)(3300)(100\times10^{-6})}\right)(83.6)$$

$$V_{DC} = \left(1 - \frac{1}{79.2}\right) 83.6$$

$$V_{DC} = (1 - 0.0126)\,83.6$$

$$= (0.9874)\,83.6$$

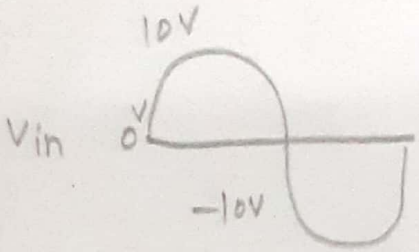
$$V_{DC} = 82.5$$

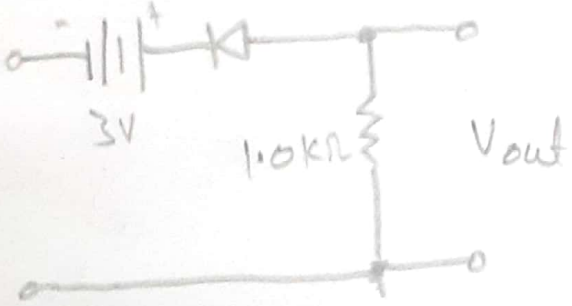
Resulting ripple factor is

$$V_{r(PP)} = \frac{2.111}{82.5}$$

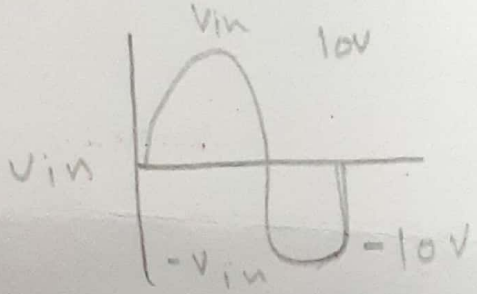
$$= 0.025$$

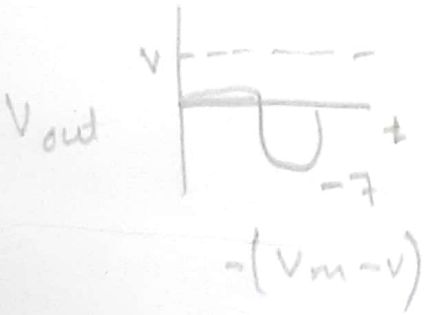
Q3 Determine the output waveform for the circuit given in Figure 3

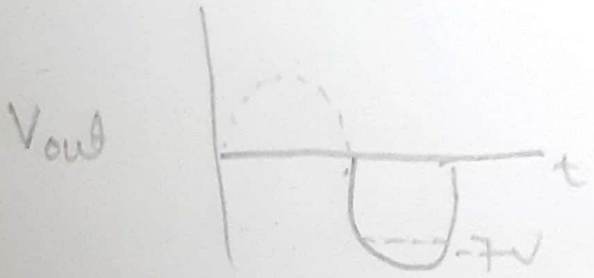




output waveform of clipper circuit







Q4

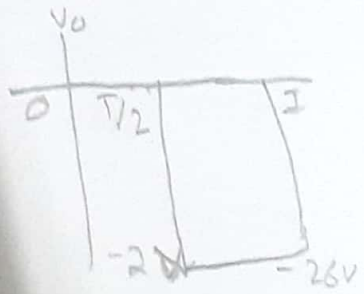
Assume the RC time constt is much greater that Period of input.

So if we

(5T discharge > 50 T/2) Thus we obtain condition for the Clamping operation

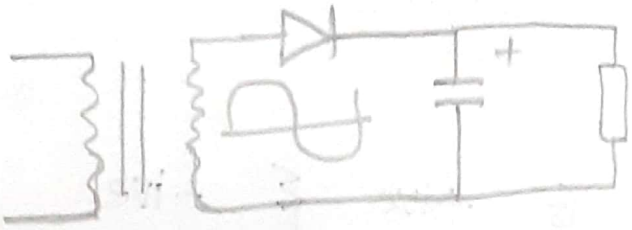
T discharge ≥ 5T

So $V_o = V_i - V + V_p(0V)$ ∴ T is the Period of input signal V_i



Q15 (a) Part.

Power Supply Filter.



Act as filter

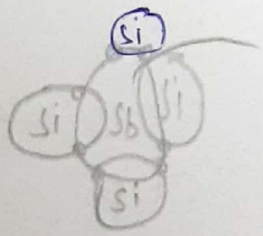
Reducing Ripples As capacitor charging & discharging

(b) Part.

N-TYPE

When a small amount of Pentavalent impurity added to a pure silicon crystal. It N-type semiconductor.

The addition of Pentavalent impurity Produce a large no of free electron in the host crystal



P-TYPE

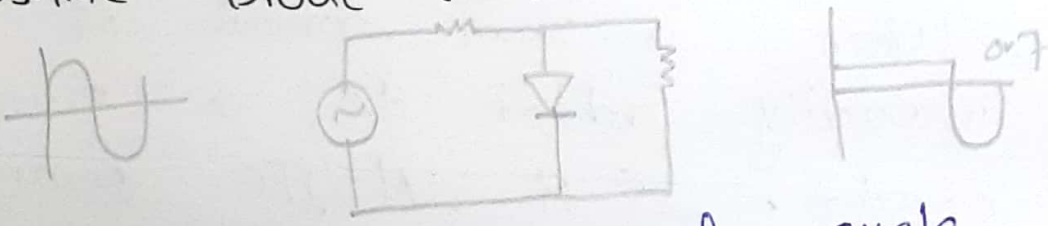
Extrinsic semiconductor formed when a trivalent impurity added to a pure semiconductor a small amount & as a result a large numbers of holes create

Part (C)

Diode limiter & +ive & -ive

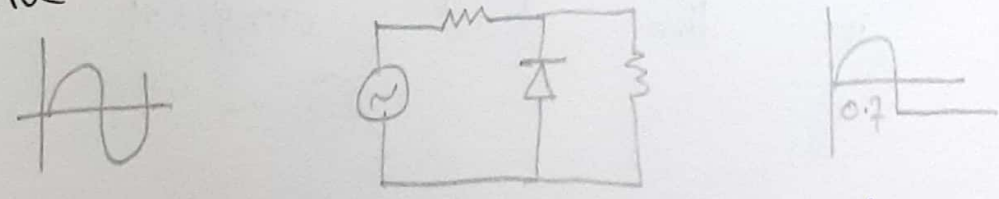
Diode Limiter A Type of circuit which is designed to clip a part of signal or A.C signal to direct wave-form.

Positive Diode limiter.



Used to clip +ive half cycle of sinusoidal wave

Negative D - Limiter



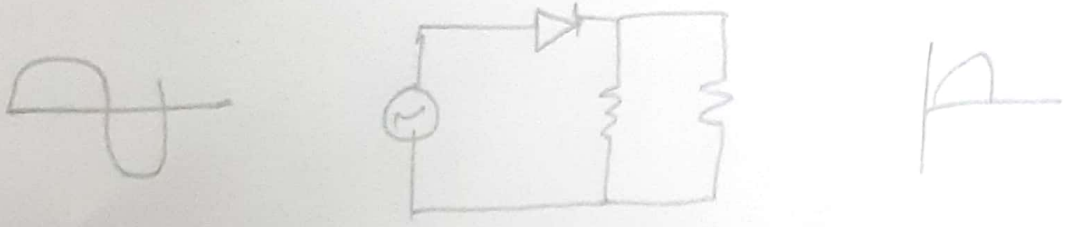
Used to clip to clip -ive half cycle to desired level.

Q5 part (D)

Capacitor Effectively act as a ~~battery~~ battery in clamping circuit.

Part (E)

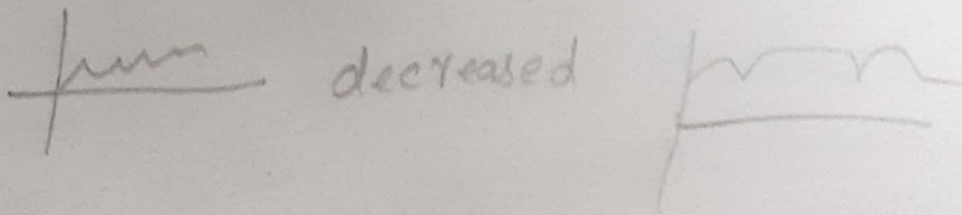
output frequency of half wave rectifier is equal as input this means as input complete one cycle at output also complete one cycle.



$f_{in} = f_{out}$

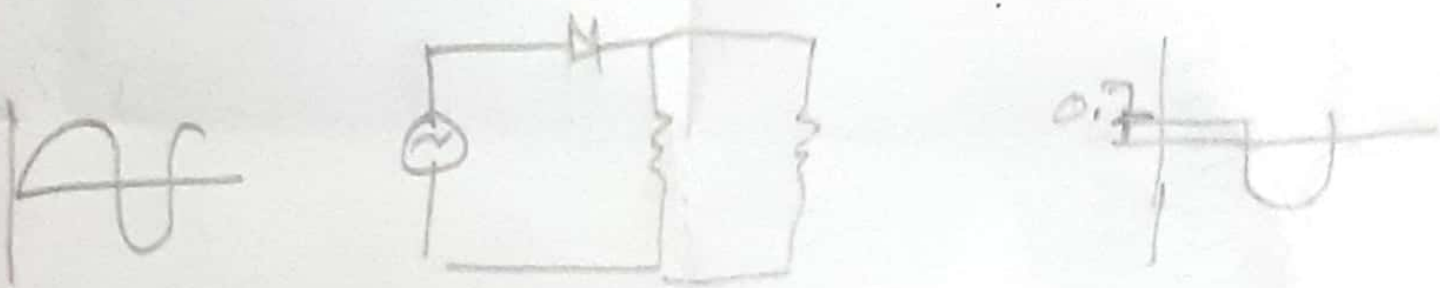
(f) Part

The load resistance to filtered power supply decrease the charging and discharging time of capacitor also increase. so talkes longer time to charge & discharge.



Part (9)

It is a circuit which is used to clip a sinusiodal wave from at a desire level.



used as a voltage regulator to keep the voltage at a desired level.