Course Title :-

Electronic Devices and Circuits.

Module :-

Summer

Instructor :-

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ID No :-

15243

Question No 5
(A) :- Answer:-

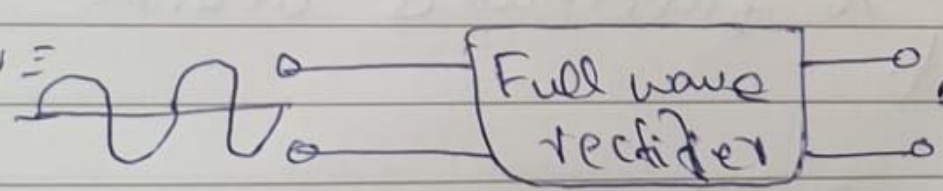
Power supply Filters:-

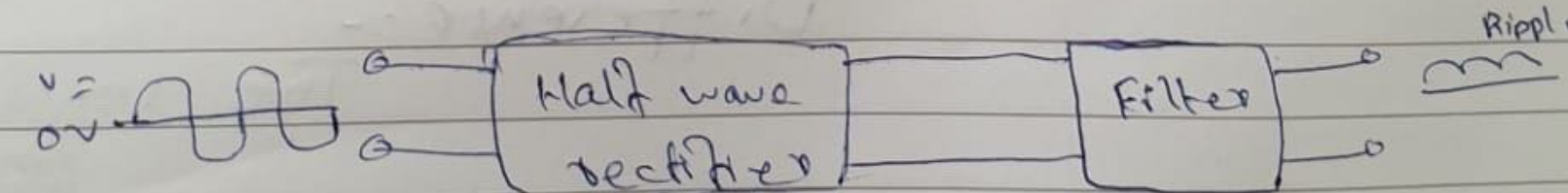
A power supply filter ideally eliminates the fluctuation in the output voltage of a half-wave or full-wave rectifier and produce a constant-level dc voltage.

① The 60Hz pulsating dc output of a half-wave rectifier or the 120Hz pulsating output of a full-wave rectifier must be filtered to reduce the large voltage variations.

② The output of a filter is nearly smooth dc output voltage.

③ The small amount of fluctuation in the filter output voltage is called ripple factor.





Question No 5:-

(B) Answer:-

The Doping of Semiconductors Pentavalent impurities, Impurity atoms with 5 valence electrons, produce n-type semiconductors by contributing extra elections. Trivalent impurities Impurity atoms 3 valence electrons produce p-type semiconductors by producing a "hole" or elections deficiency.

Question No 5

(C) Answer:-

The Diode Clipper, also known a a Diode Limiter, is a wave shaping circuit that take an input wave form and clips or cuts off its top half, bottom half or both halves together. This Clipping of the input signal produce an output wave form that resembles a flattened version of the input.

Difference:-

The seria

Negative Limiter Limits the negative portion of the input pulse. The difference between the series negative limiter and a positive limiter is that the diode is reversed in the negative limiter. In the Parallel positive Limiter the positive portion of the input signal is Limited when the diode conducts.

Question 5

(D) Answer:-

As Vin becomes negative, the capacitor acts as a battery of the same voltage of- Vin. The voltage source and the capacitor counteract each other, resulting in a net voltage of- zero as seen by the load.

Question No 5 7...

The major difference between clipper and clamper is that clipper is a limiting circuit which limits the ~~about~~ output voltage while clamper is a circuit which shift the DC level of output voltage. The clipper and clamper circuit are exactly opposite to each other regarding their working principle.

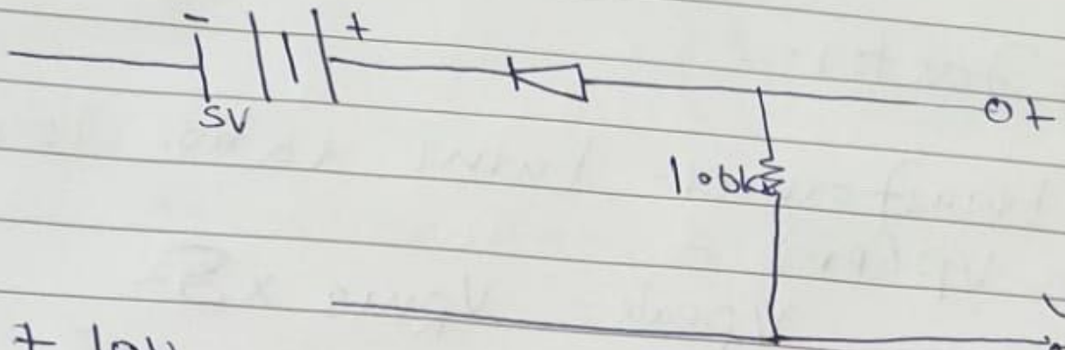
Question 5

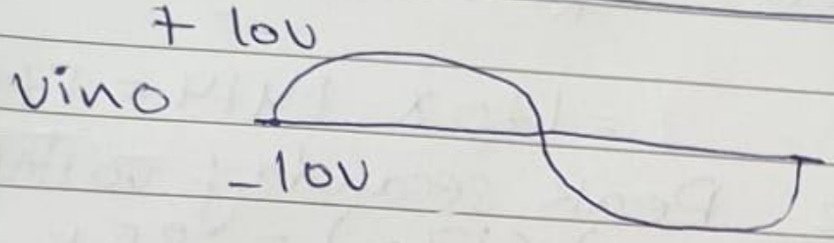
(E) Answer:-

When a 60Hz Sinusoidal voltage is applied to the input ~~of~~ to the input of a half wave rectifier the out put frequency remain same that is 60Hz

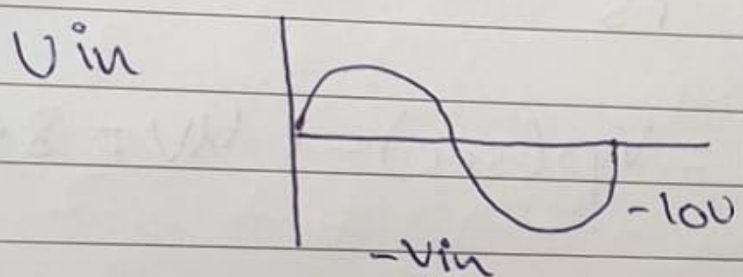
Question No 3:-

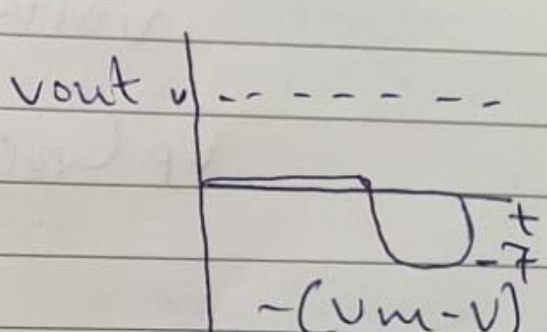
Sol:-

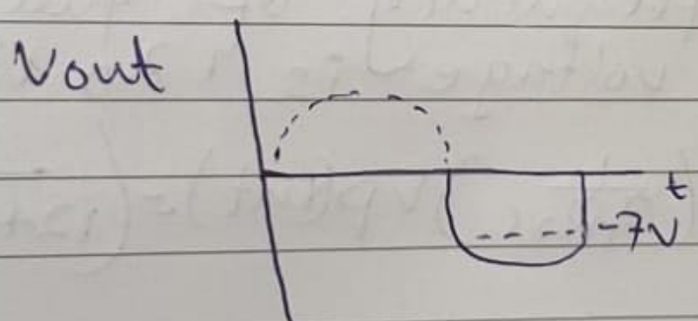




output waveform of clipper circuit







Question 2:-

Sol:-

Determine the Ripple factor.

transformer turns ratio is $n = 0.5$

$V_{p(pri)}$ =

$V_{peak} = V_{RMS} \times \sqrt{2}$

$= 120 \times 1.414 = 170V$

The Peak secandry voltage

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

The unfiltered full wave rectifier voltage is

$V_{p(rect)} = V_{p(sec)} - 1.4V = 8.5V - 1.4$

$= 83.1$

The frequency of full wave retifier voltage is 120 Hz

$V_r(PP) = \left(\frac{1}{fR_2C}\right) V_{p(int)} = \left(\frac{1}{(120+12)(33000)(100\mu F)}\right)$

$V_r(PP) = 2.111$

The approx p/c value of output voltage is determined as follows.

$$V_{DC} = \left(1 - \frac{1}{2 f R L C}\right) V_{p(rect)} =$$

$$\left(1 - \frac{1}{2(120)(330)(100\mu)}\right)$$

82.544

resulting ripple factor

$$r = \frac{V_{r(pp)}}{V_{DC}} = \frac{2.11}{82.544} = 0.02556.$$

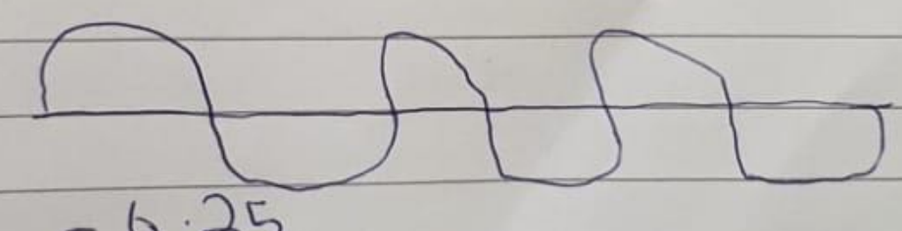
Question No 1:-

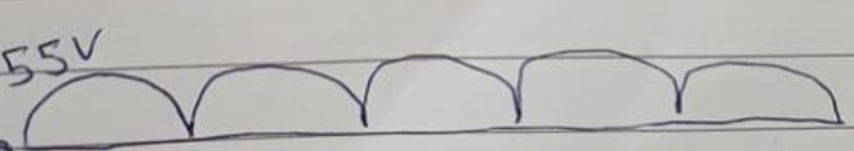
(b) Total Peak Secondary voltage

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

(c) Half of the secondary voltage

6.25





(8)

There is 6.25V Peak to Peak voltage the output voltage has a Peak value of 6.25 - 0.7 which is diode drop.

Peak current through each diode.

$$I_F = \frac{\frac{V_{p(sec)}}{2} - 0.7}{R_2} = \frac{5.55\,V}{10k\Omega} - 0.00055$$

$$= 0.555mA$$

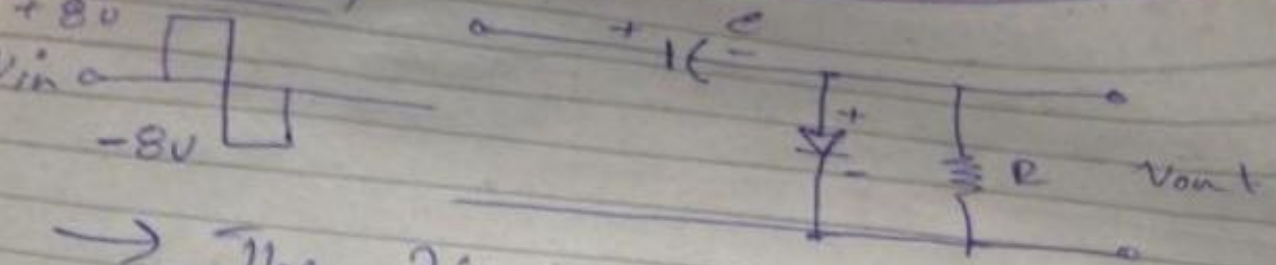
c) PIV rating must diode has

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

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

$$= 11.8\,V$$

(Q#4)



→ The figure shows that the circuit is a negative clamper with a square wave input voltage. So as a whole the negative clamper will add a -ive dc offset to the input signal.