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Subject:- Power electronics

Assignment:- Final project

Module:- 8th

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=) Application of power electronics :-

Application of power electronics range in size from a switched mode power supply in an AC adapter, battery chargers, Audio amplifier, florescent lamp ballasts through variable frequency drives and DC motor drives used to operate pumps, fans and manufacturing machinary up to gigawatt scale high voltage direct current power transmission system in interconnect electrical grid.

1) DC/DC converter
2) AC/AC converter
3) AC/DC converter
4) DC/AC converter

=) characteristics of power diodes:-
the I-V characteristics of power diode, is as shown in fig. the forward current increase linearly with an increase in forward voltage. A very small amount of likage current flows in the reverse bias. the leakage current is independent

of the applied reverse voltage. The leakage current flows due to minority charge carriers. When the reverse voltage reaches the reverse breakdown voltage, avalanch breakdown occurs.

1) High voltage rectifier
2) As freewheeling diode
3) As feed-back diode.

(Q 2) merits and demerits of power diode:-

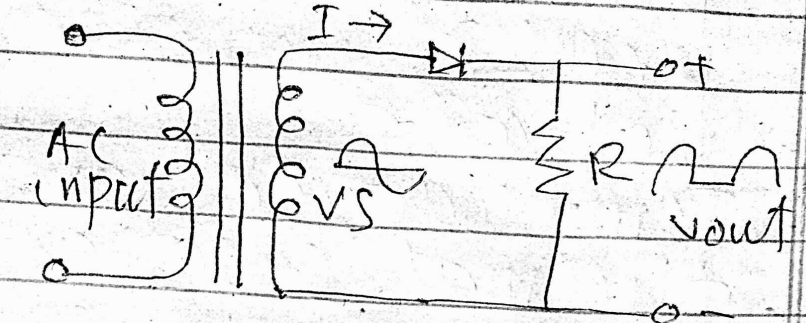
=) merits

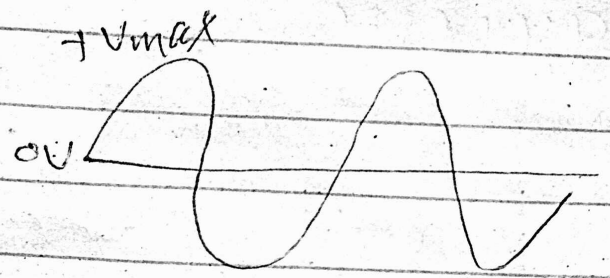
1) => simplicity of design
2) low forward count
3) space savening
4) low noise
5) first transient response
6) low cost

=) Demerits

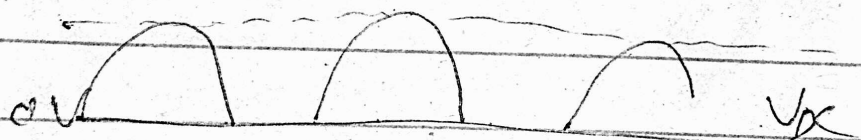
1) low efficiency if input output difference is large
2) low efficiency = significant heat dissipation.
3) may require a heat sink.
4) capable exclusively of step down operation.

⇒ Power Diode used as a Half wave rectifier:





AC input waveform



Resultant output waveform.

equation:

$$I_D = I_s \left(e^{V_D/0.026} - 1 \right)$$

=) parameters of the power diode circuits-

(1) max. forward current
(2) peak inverse current
3) peake inverse voltage
4) Temperature and thermal resistance
(5) frequency
6)