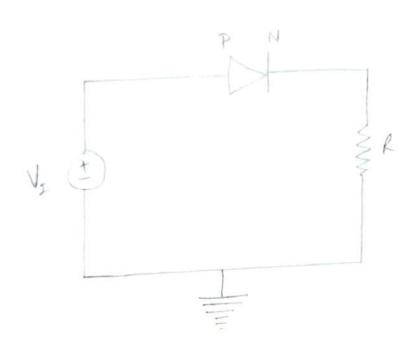
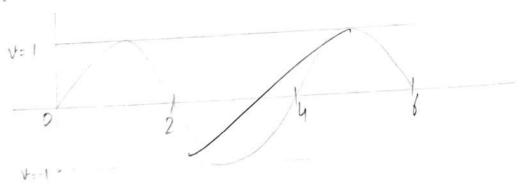


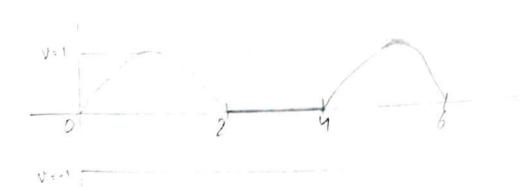


|   | I LEDING INDIA MAKIMATITUTE DI TERINGERA  |
|---|---|
|   | Name Dww Bagaya Branch CSE Sem  |
|   | Roll No Date  |
|   | EXPERIMENT - 5  |
|   | 111 margat-   |
|   | Objective - Study of single phase half wave uncont-   |
|   | roud rucyfur.   |
|   | (1) Explain rectification.  |
|   | (3) Explain Malf wave rectification: For +ve half cycle.  |
| • | (3) Explain Malf wave rectification: For -ve half cycle.  |
|   | a : t : load diode.   |
|   | Apparatus Required - Al source, Resistive load, diode.  |
|   |   |
|   | Rectification -   |
|   | Alternating coverent -> Rectifier -> Direct current   |
|   | 1 Italian time  |
|   | A rectifier is a device that converts alternating   |
|   | A rectifier is a device that converts alternating current (AC) to direct current (DC), a process known as rectification. Rectifiers are essentially of two types - a half wave rectifiers and a full wave rectifier.  |
|   | process known as rungher a half wave rectifiers   |
|   | essentially of more reletifier.   |
|   | and a full with   |
|   | May work Rectification -  The positive cycle the diode is forward biased.  On the positive cycle the diode is forward biased.  By using a clicid we have converted an AC source into a pulsating DC source. In summary we have into a pulsating DC source. In summary we have into a pulsating DC signal.  "rectified the AC signal."                     |
|   | On the positive cycle the mont converted an AC source   |
|   | By using a clical we source. In summary we have   |
|   | into a fulsaring of the AC signal.  |
|   | nectified hind of rectifier circuit is the half   |
|   | into a fulscring of the AC signal.  "rectified the AC signal.  "rectified the AC signal.  "he simplest kind of rectifier circuit is the half  "the simplest kind of rectifier is a circuit  wave rectifier. The half wave rectifier is a circuit  wave rectifier only part of an input signal to hass.  that allows only part of an input signal to hass. |
|   | want allows only part of in ingine  |
|   | Thus U  |



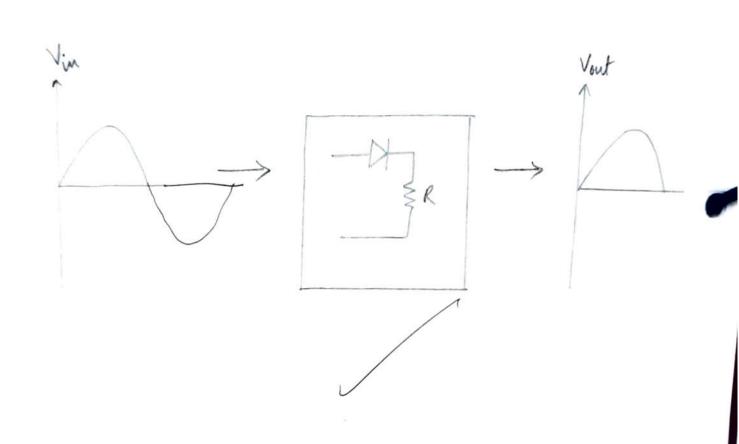
Half Ware Rectifiers - Wareforms

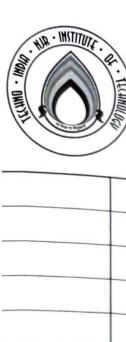






|   | Name Druw Bagoua Branch CSF Sem 1  |
|---|--|
|   | Roll No Date   |
|   | The circuit is simply the combination of a signal sliede in series with a resistor, where the resistor is acting as a load.  |
| • | Half wave Rectifiers - The output DC voltage of a half wave rectifier - can be calculated with the following two ideal equations.  Year = Vrms x J2  |
|   | Vac = Vpeak  |
| • | Where, $V_{I} = Input voltage$ Yh = bar  Malf wave Rectification - For the half cycle:  Diede is forward biased, acts as a short circuit hasses the waveform through.  For the half cycle: $V_{I} - V_{b} - I r_{d} - IR = 0$  |
|   | where, $V_{2}$ = input voltage $V_{0}$ = barrier pollutial $V_{0}$ = diode resistance $V_{0}$ = total current  |
|   | I - VI - Vb  Md + R  |
|   | The state of the s |

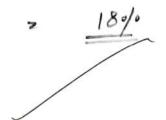




|   | Name Dhur Bagora Branch CSE Sem 1  |
|---|--|
|   | Roll NoDate  |
|   | V TP   |
|   | Vo = VI - Vb x R   |
|   | ry + R   |
|   |  |
|   | for Ma << R<br>Vo = Vz - Vb  |
|   | Vo is 0.7 for germanium.   |
|   | Vo is 0.7 for germanium. Vo is 0.7 for silicon.  |
|   | For VI < V6:   |
|   | The diade will remain off. The output voltage will                                     |
|   |  |
|   | $V_0 = 0$  |
|   | Toy VI > Vy :  |
| • | For $V_{\mathcal{I}} > V_{\mathcal{V}}$ : The diode will remain on. The output voltage |
|   | vill be, $V_0 = V_I - V_6$   |
|   | No a NI NP   |
|   | 1 outhut voltage-  |
|   | Average output voltage-  |
|   | Vo = Vm sin wt , + o < wt < M  |
|   | 1/ - / 10t / 2T  |
|   | <b>V</b> <sub>0</sub>  |
|   | Vav. = Vm = 0.318 Vm   |
|   | T  |
|   |  |

#### Observation Table -

| Max. Input | Theoritical<br>Vrus | Practical<br>V <sub>nms</sub> |
|------------|---------------------|-------------------------------|
| 10 V       | 5 V                 | 5.09V                         |
|            |                     |                               |



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|   | Name Dhrur Bagara Branch CSE Sem 1  |
| • | Roll NoDate   |
|   | Vrus = Irms R = Vm<br>2   |
| • | Average load current -  |
|   | I ay = Vav = Vm<br>R  |
|   | Iav = Vm = Im TR T  |
| 0 | RMS load current  |
|   | I HIM = IM 2  |
| , | Form factor - It is defined as the ratio of runs<br>load voltage and average load voltage |
|   | F.F Vrung<br>Var.   |
|   | FF. 2 Vm 2 7 2 1.97   |
|   | 7   |

por a une arration NT

rms ≥ arg



| DATE: TECHNOL | Name Dhuw Bagana Branch CSE Sem 1   |
|---------------|---|
|               | Roll No. Date   |
| •             | Ripple Factor - Y = \( \int F.F^2 - 1 \) \( \text{100} \) \( \frac{1}{2} \)                     |
|               | $\frac{1.57^{2}}{2} \times 100^{9/3}$   |
| •             | reficiency - It is defined as the ratio of do power available at the load to the input ac power |
|               | ac power  |
|               | N°/0 = Pead x 100°/0  |
|               | Pin   |
|               | 11 ·/· = I oc x R x 100 of o  I rum x R   |
|               | No/o = Im x 100 /o  |
|               | T'm<br>y  |
|               | Nojo = 4 X 100  |
|               | × 40.56%  |
|               |   |
|               | Result - we have studied a single phase Half wave electified and wave forms acce                |
|               | Shown.  About 22 x t  |
|               |   |