|      | Date  |
|------|---|
| Expt | r. No Page No   |
|      | Enperiment-3  |
|      | Objective: To estimate the band gap energy (Eg) of<br>Ge crystal from resistivity vs temperature<br>measurements voing four probe technique |
|      | Apparatus: Digital anmeter, digital voltmeter, prohes,<br>graph, DC current source.   |
|      | Formula used: ln V = (Eg /2KT) + A  f=f./q  |
|      | Result: $R=62\Lambda$ $1. = 90.77 \Lambda cm$   |
|      | f = 11.35scm  |
|      |   |
|      |   |
|      |   |
|      |   |
|      |   |
|      | Teacher's Signature   |
|      |   |

grand 102003253

From resistivity vs temperature measurements using your probe technique

Apparatus: Digital'ammeter, digital voltmeter, probes, graph, de current source.

Formula used: en V=(Eg/2hT)+A; f=.f./q

Observations & Result: Ginen 1= 1.5 mA

| Temperature | 1/T (10-3)                                    | V(mV)   | enV  |  |  |
|-------------|---|---|--|--|--|
| 306         | 3:267   | 121   | 4.791  |  |  |
| com 306600  | 3.164   | 114   | 4.736  |  |  |
| 326.        | 3.067   | 99  | 4.595  |  |  |
| 336         | 2.976   | 8 1   | 4.395  |  |  |
| 346         | 2.890   | 62  | 4.127  |  |  |
| 356         | 2.803   | 47  | 3.850  |  |  |
| 366         | 2.732 11 3                                    | 3 6   | 3.583  |  |  |
| 376         | 2.659   | 28  | 3.332  |  |  |
|             | 306<br>316<br>326<br>336<br>346<br>356<br>366 | 306<br>316: 3.164<br>326: 3.067<br>336<br>2.976<br>346<br>2.890<br>3.66<br>2.898<br>2.898 | 306<br>3:267<br>3:16<br>3:16<br>3:16<br>3:16<br>3:16<br>3:16<br>3:067<br>41<br>3:36<br>2:976<br>8:1<br>3:46<br>2:890<br>62<br>3:56<br>2:808<br>47<br>3:6<br>2:732<br>3:6 |  |  |

Band Gap = Stope \* 2 \* R

k = Beltzmann's Constant = 1.38 x 10 - 23 J/K = 8.6 17 X 10 5 e V/K

·Alap, R= W/w= 6201 bis on collection

f. = 2TS(V/I) = 90.77 scm.
fc = f./q = 90.77/8 scm = 11.35 scm

gramp.

