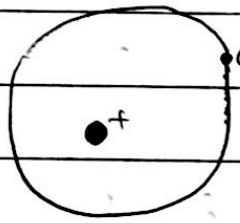
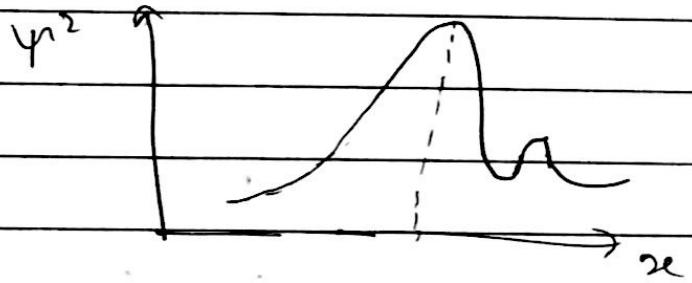
Date

1- Quantum Numbers



ψ → wave form.

ψ^2 → probability density.



1-D

$$E(\psi) = \frac{\hbar^2}{2m}\frac{d^2\psi}{dx^2} - V\psi$$

↓ Potential

$$E = \frac{RZ^2}{n^2}$$

R = −13.6 eV

Z = Prot. no.

n → integer.

Z = 1 ; H

n → Principle Quantum No.

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L → Angular QN
M → Magnetic QN

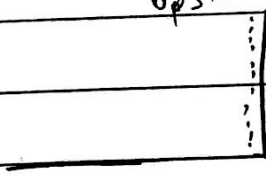
$n \Leftrightarrow [1, 8] \cup [8, \infty)$

least possible.

$L \Rightarrow \quad 0 \longrightarrow (n-1)$

$m = \quad -l \longrightarrow 0 \longrightarrow +l$

Uhlenbeck & Goudsmit } → spin QN



Sodium test,

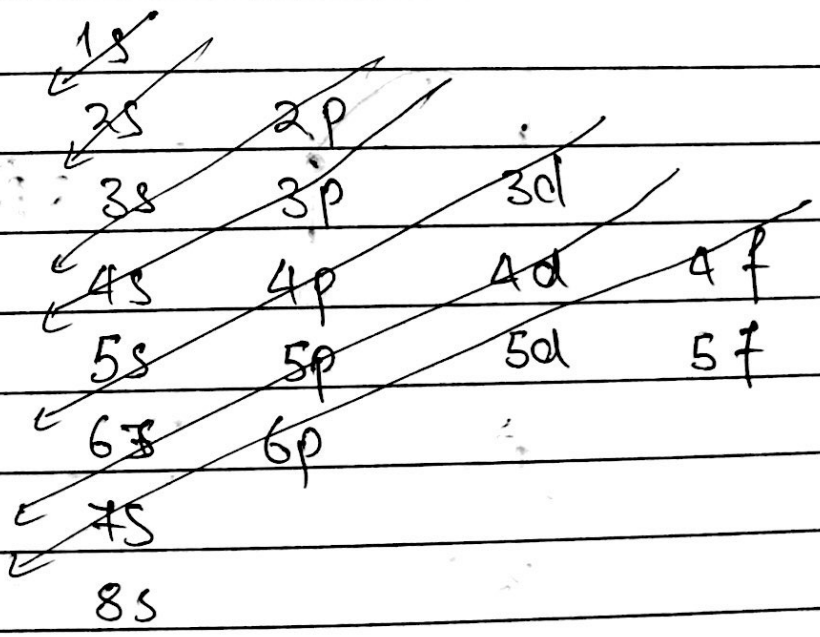
$s \quad (+\frac{1}{2} \uparrow) \quad (-\frac{1}{2} \downarrow)$

Pauli's Exclusion Principle

#_____
#_____

Shell	n	l	M	s	
s	1	0	0	$\pm 1/2$	2
s	2	0	0	$\pm 1/2$	2
p		1	-1 0 +1	$\pm 1/2$	6
s	3	0	0	$\pm 1/2$	2
p		1	-1 0 +1	$\pm 1/2$	6
d		2	-2 -1 0 1 2	$\pm 1/2$	10

Aufbau Principle



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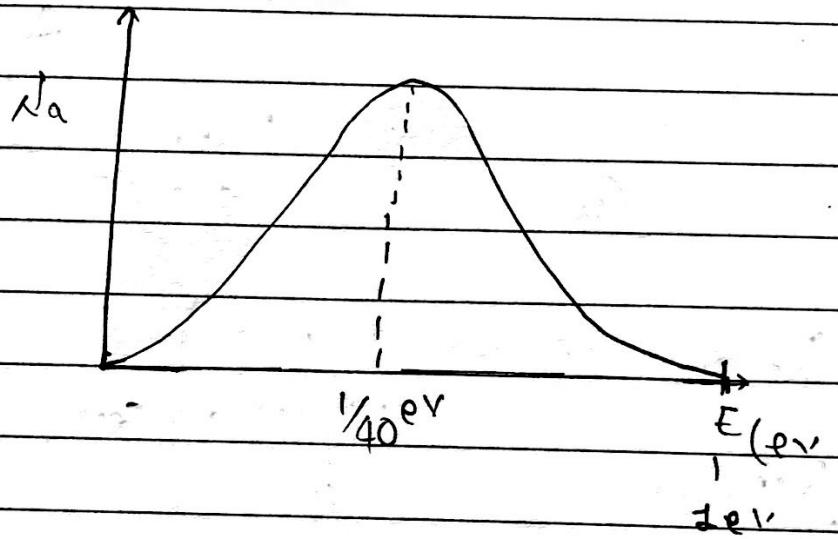
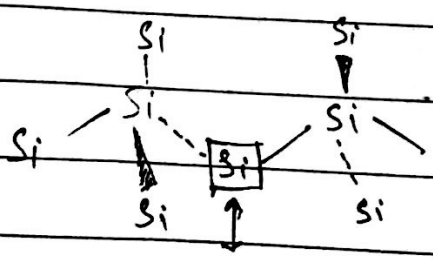
3- Semi-conductors, Diodes and Transistors

Si $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^2$



Poping

P	i	n
holes.	-	e^-
13 gp	14 gp	15 gp
Ga	Si	P
B	Ge	



III {pin} dope

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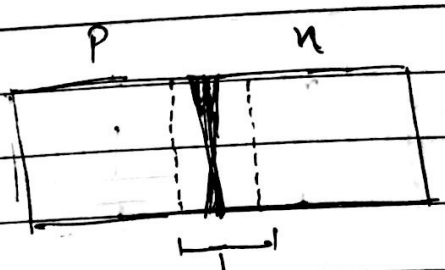
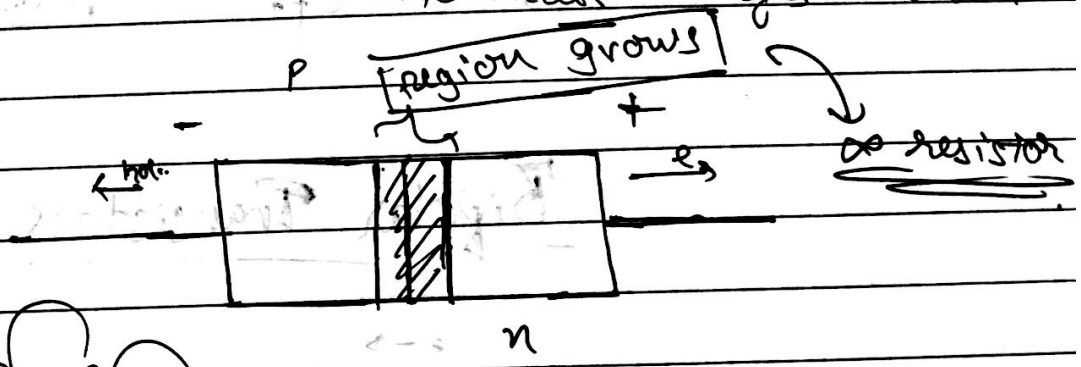
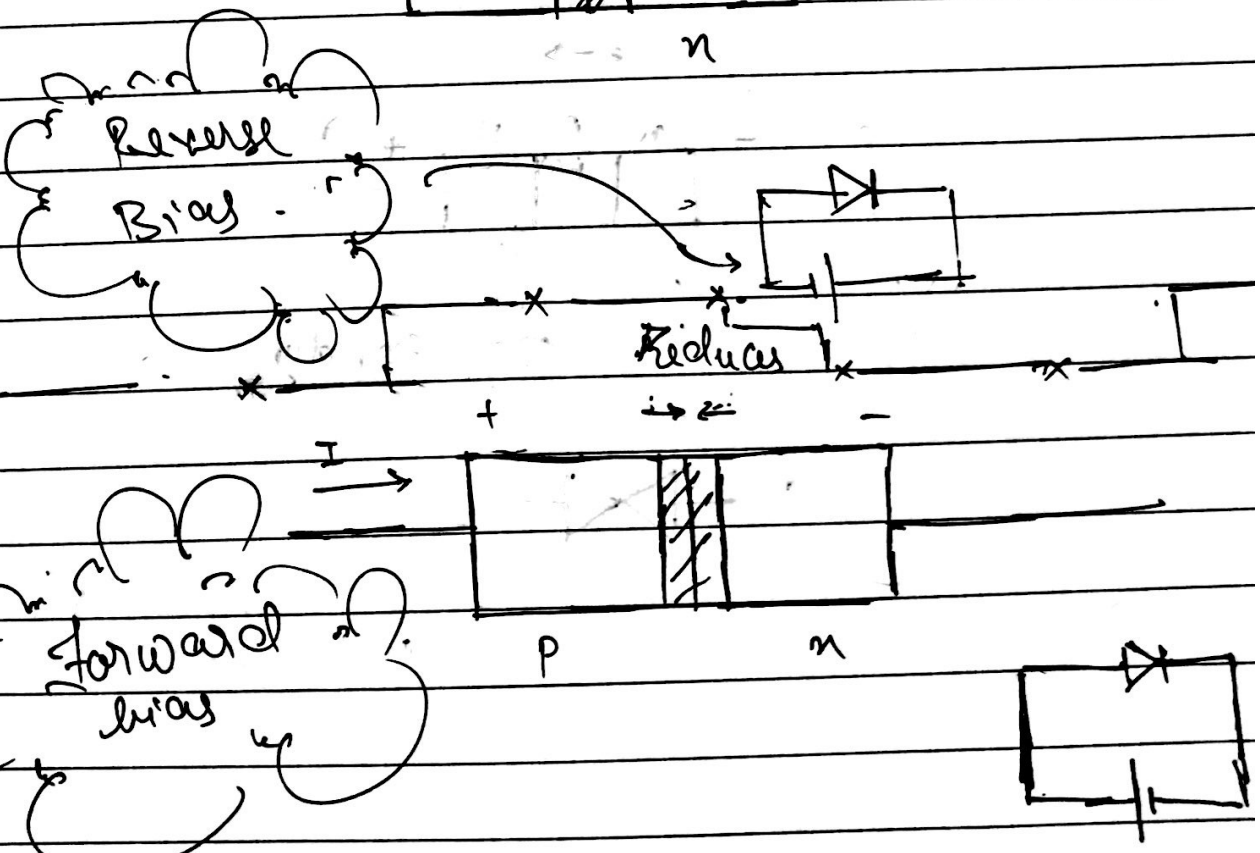


depletion region → e^- → n type, p type ← hole → fill

r/o access charges remain.



Reverse Bias



Forward bias

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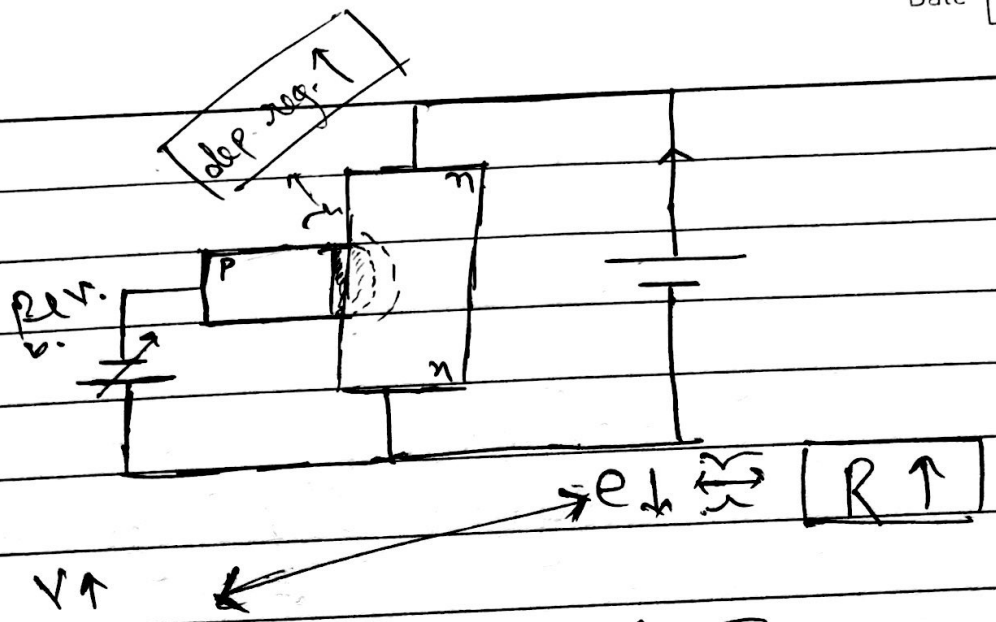
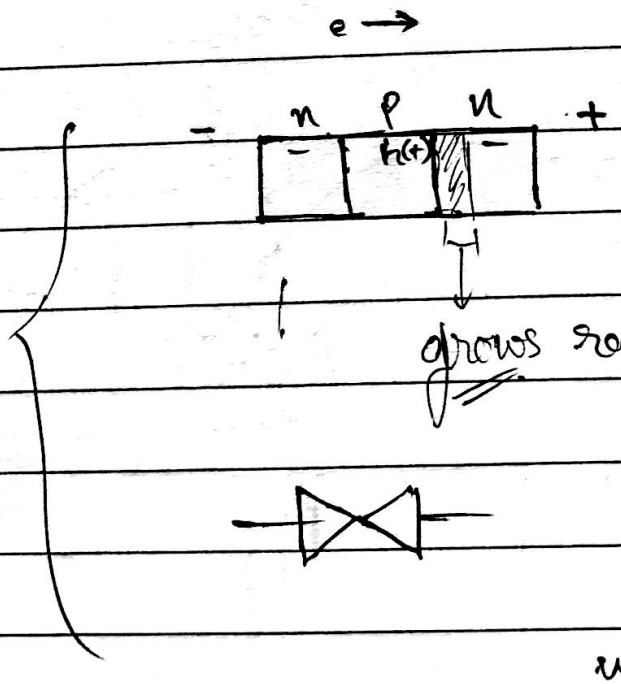


Field Effect Transistor.

Bipolar Transistors



useless, seemingly.

Date

n-p-n