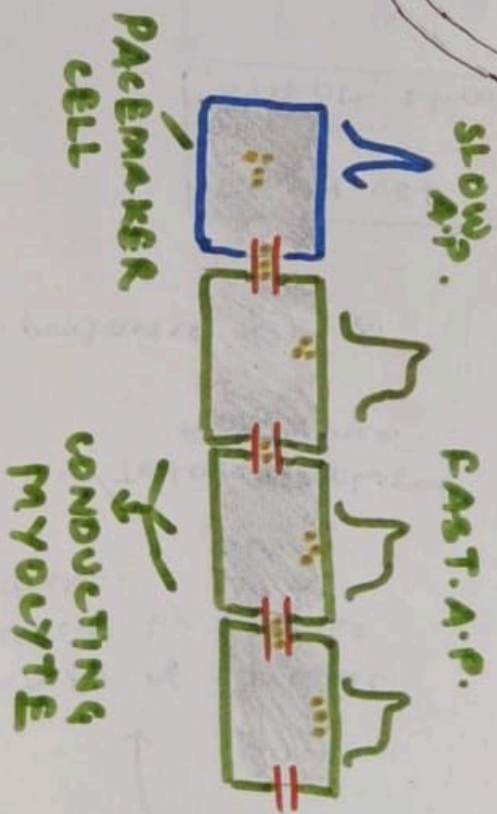
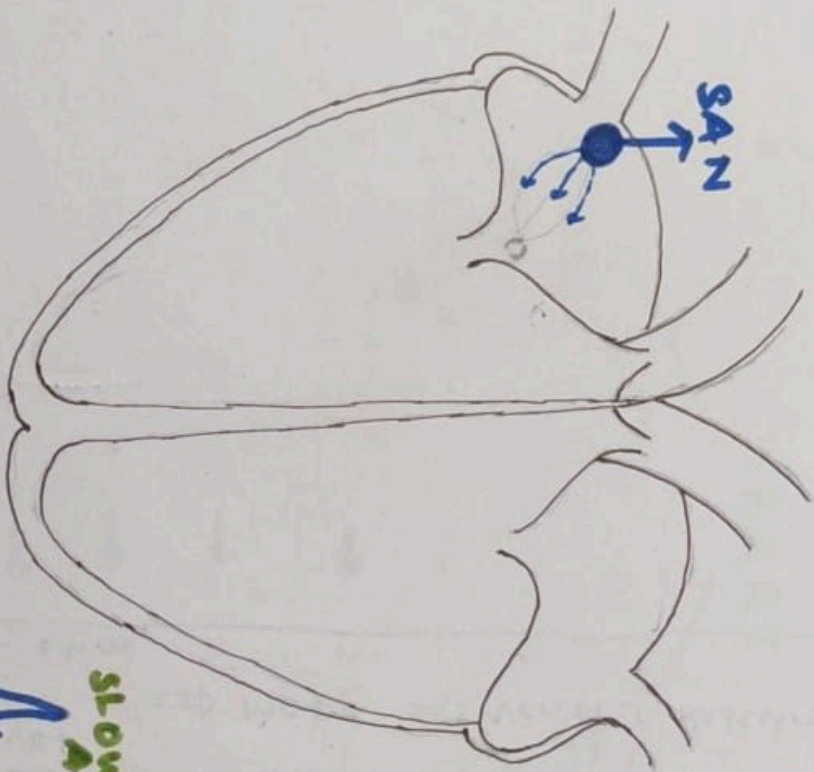




CARDIAC A.P.

HEART

SLOW
A.P.

(SAN)

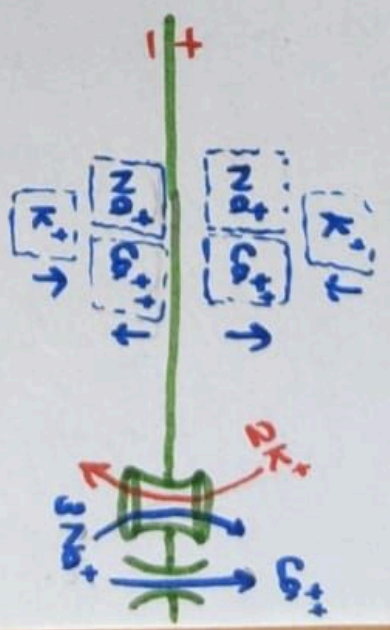
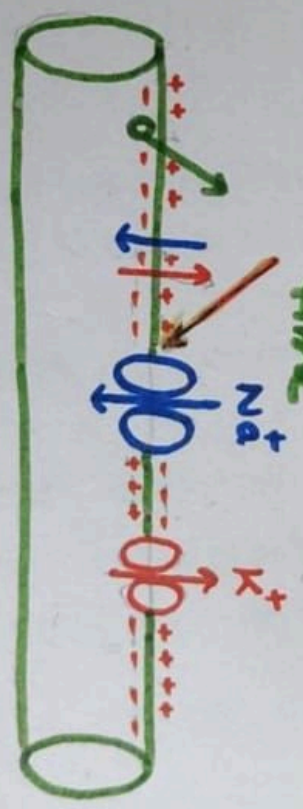
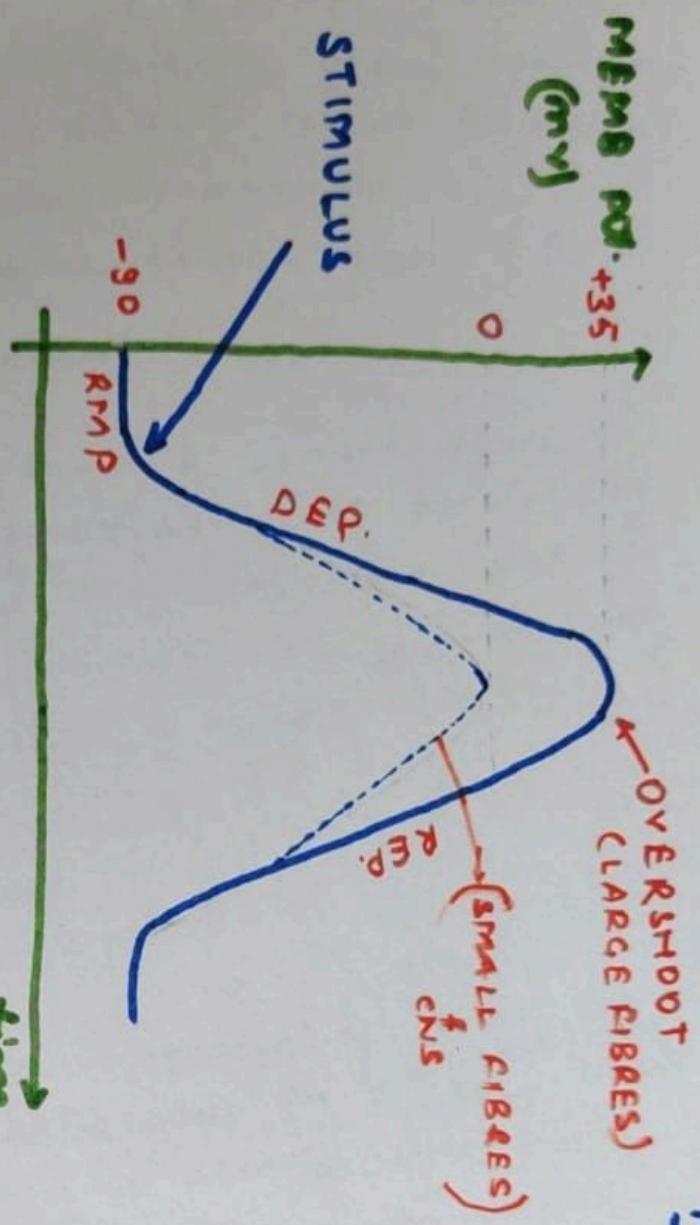
- ALSO KNOWN AS PACEMAKER ACTION POTENTIAL
- DEPOLARISATION DUE TO INFLUX OF Ca^{++} ION
- NOT TRUE RMP
- SELF EXCITATORY
- PLATEAU PHASE NOT SEEN
- SLOW DEP. BUT RAPID RECOVERY

FAST
A.P.

(CONTRACTILE & CONDUCTING CELLS)

- ALSO KNOWN AS NON-PACEMAKER ACTION POTENTIAL
- DEP. DUE TO INFLUX OF Na^{+} ION
- TRUE RMP
- STIMULUS REQUIRED
- PLATEAU PHASE IS SEEN
- FAST DEP. BUT PROLONGED RECOVERY

NORMAL A.P.



[Ca²⁺ influx]

• L-TYPE Ca²⁺ CHANNEL CLOSE

• K⁺ CHANNEL OPEN

[K⁺ efflux]

MEMB. POTENTIAL (mv)

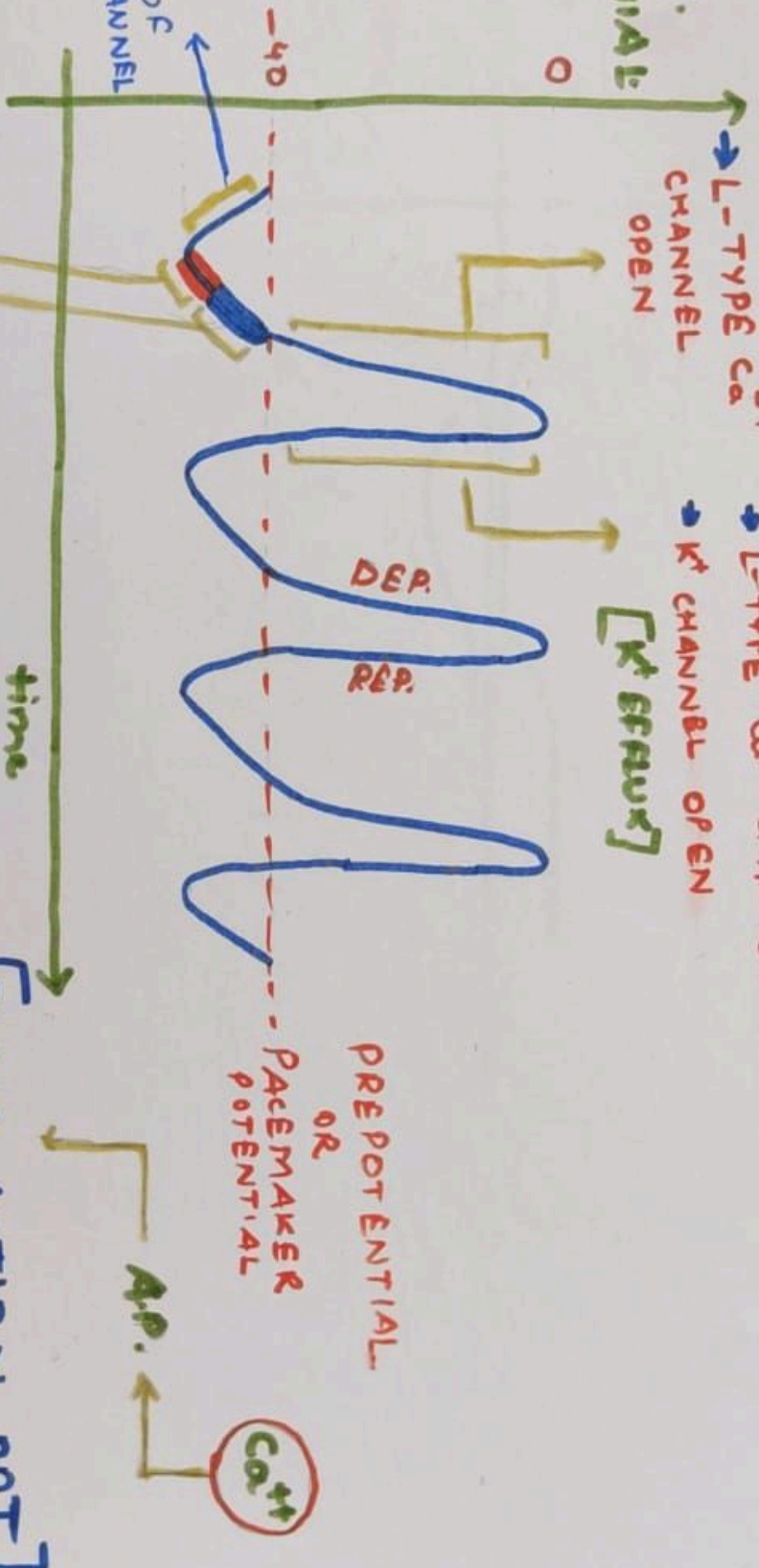
→ L-TYPE Ca²⁺ CHANNEL OPEN

CAUSES OPENING OF FUNNY CHANNEL

→ SLOW ENTRY OF NO⁺ THROUGH FUNNY CHANNEL (HCN CHANNEL)

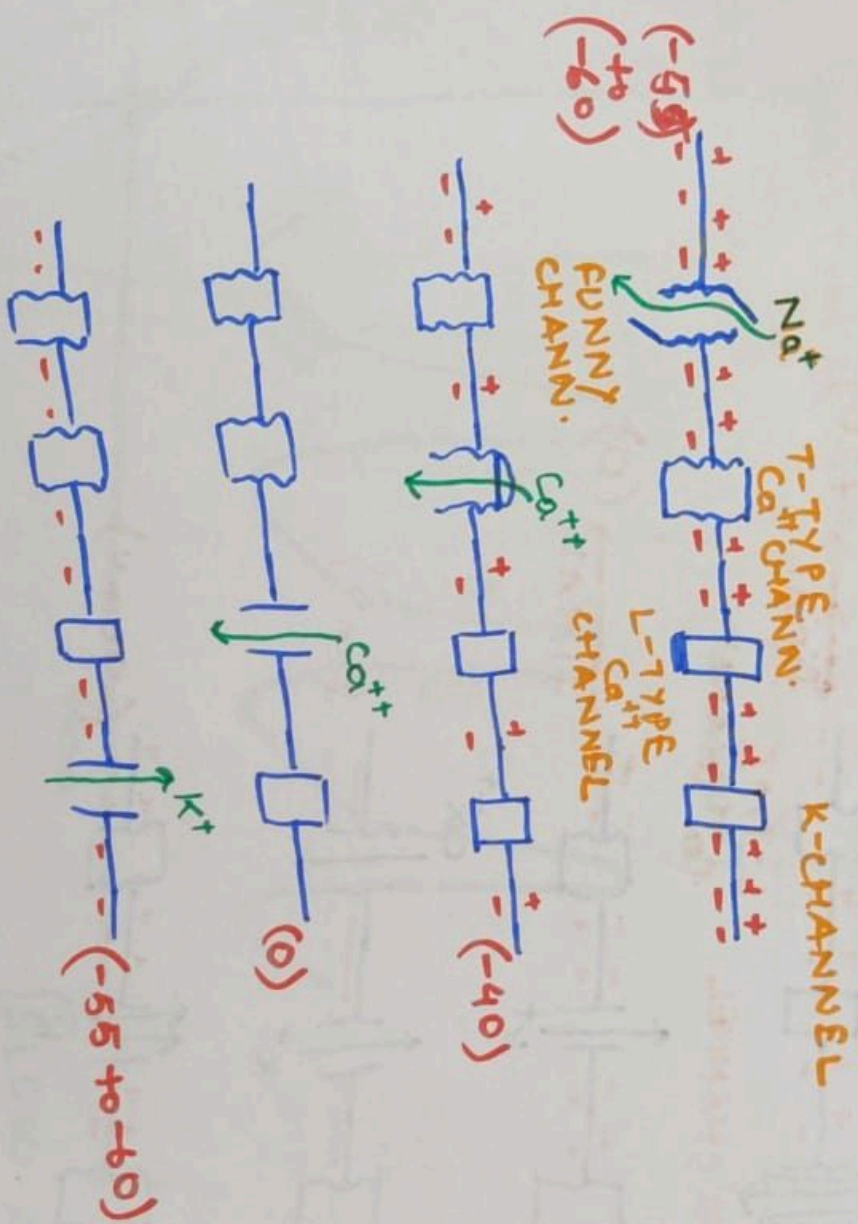
IVABRADINE

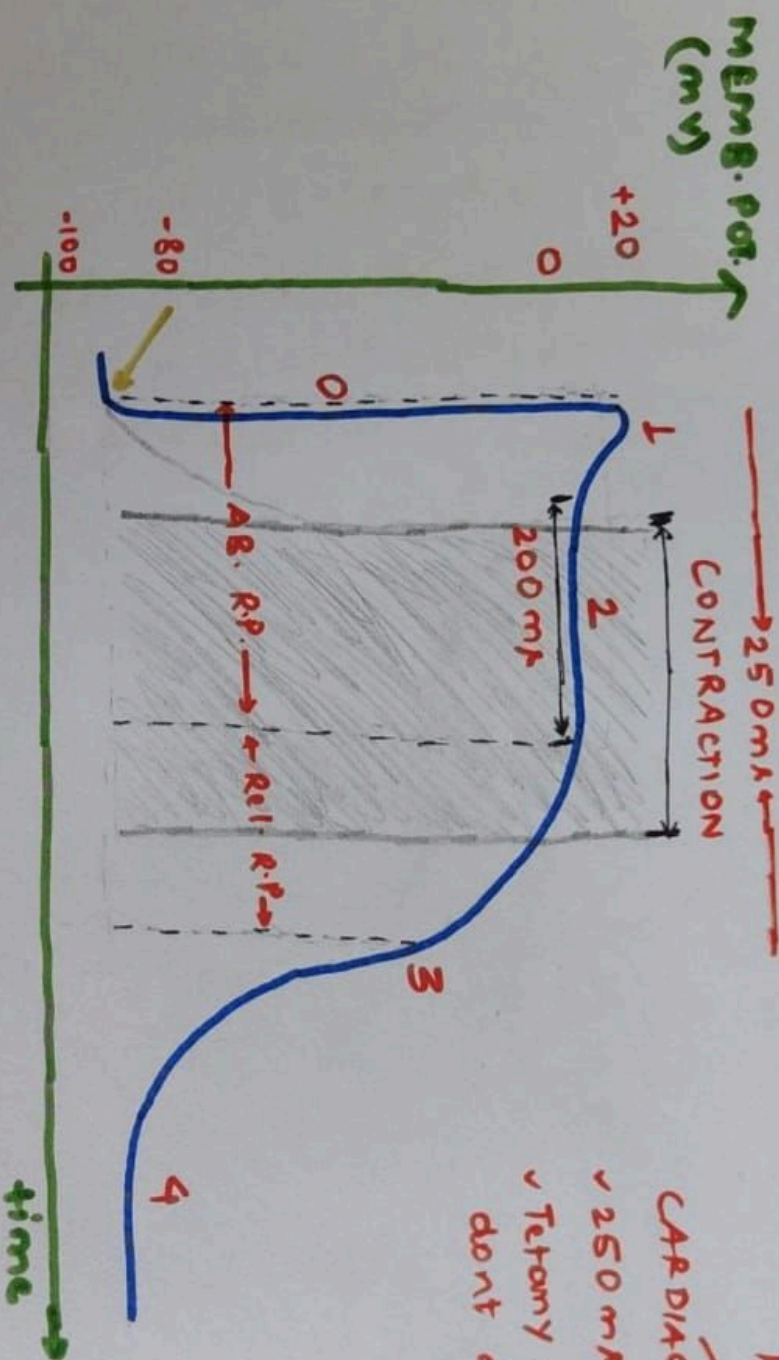
• SLOW ENTRY OF Ca²⁺ THROUGH Ca²⁺ CHANNEL (T-CHANNEL)



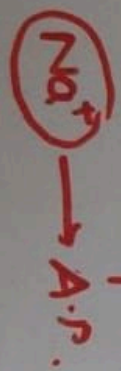
[SLOW ACTION POT. OR PACEMAKER POT.]

T-TRANSIENT
L-LONG LASTING

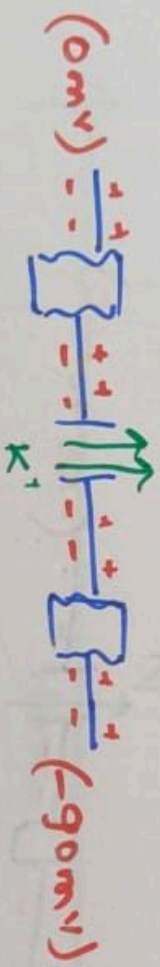
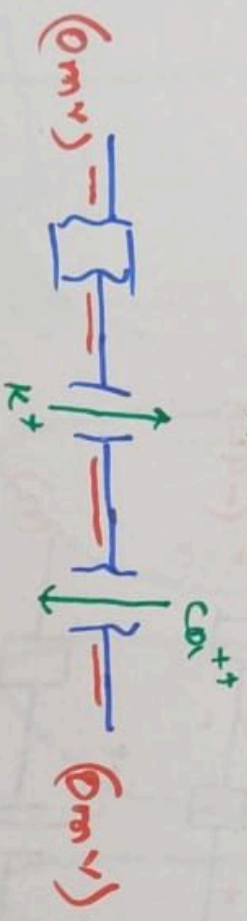
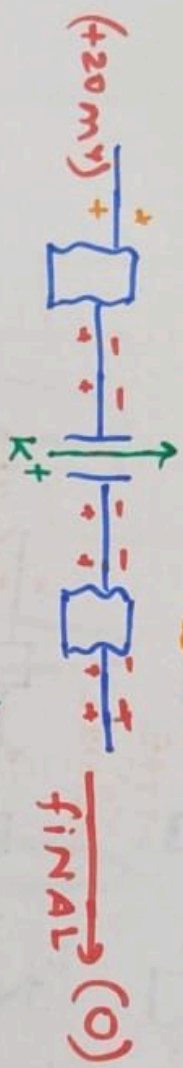
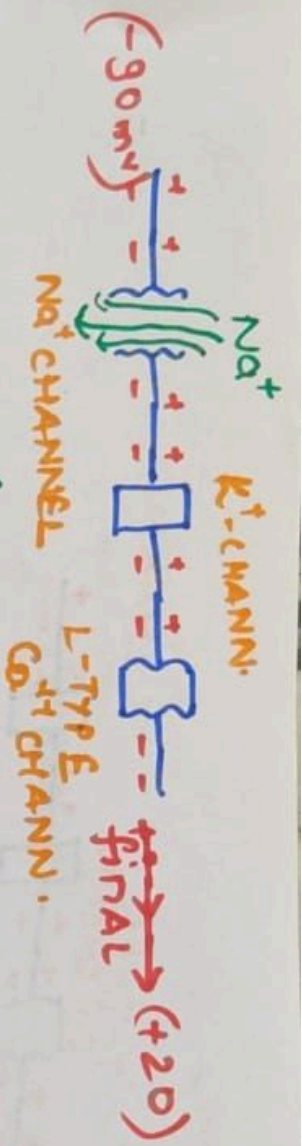




[FAST A.P. IN CONDUCTING MYOCYTES]



REF. Pd.
 CARDIAC MUS. 250 ms
 Tetany & fatigue don't develop.
 SKELETAL MUS. 1 ms
 Develops



STIMULUS RECEIVED



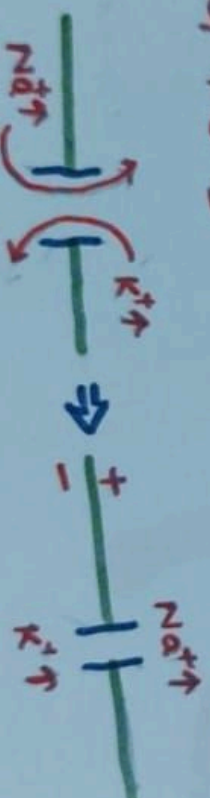
PHASE 0 :- DEPOLARISATION PHASE $\Rightarrow$ Na^+ CHANNEL OPEN
 $[\text{Na}^+ \text{ INFLUX}]$

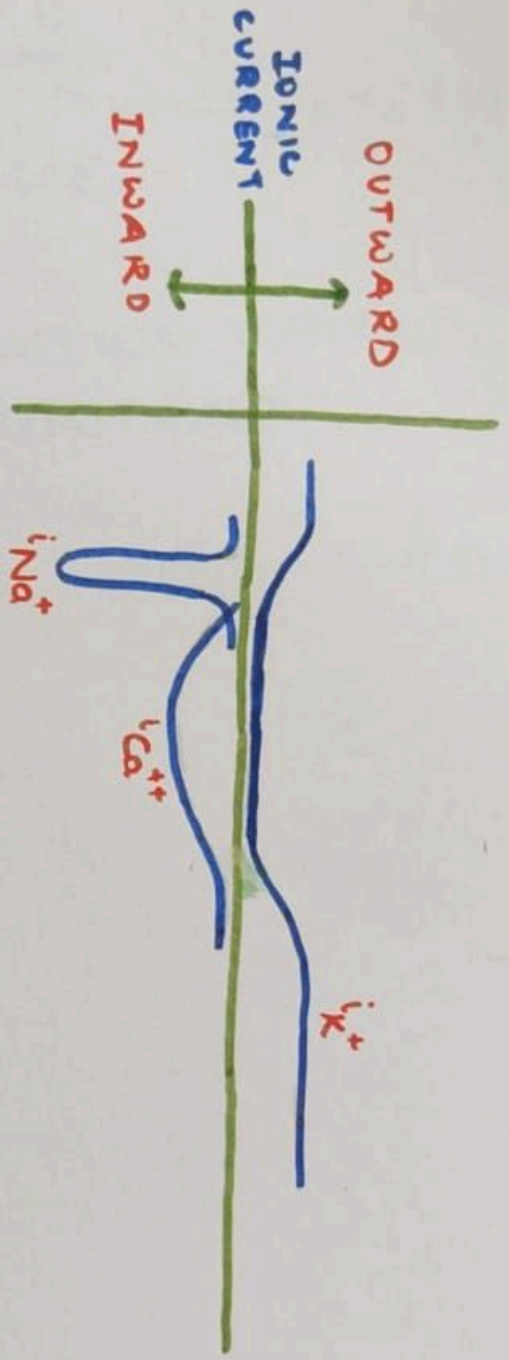
PHASE 1 :- INITIAL REPOL. PHASE $\Rightarrow$ Na^+ CHANNEL CLOSE
 $\cdot \text{K}^+$ CHANNEL OPEN
 $[\text{K}^+ \text{ EFFLUX}]$

PHASE 2 :- PLATEAU PHASE $\Rightarrow$ $\cdot$ L-TYPE Ca^{2+} CHANNEL OPEN
 $\cdot \text{K}^+$ CHANNEL OPEN
 $[\text{Ca}^{2+} \text{ INFLUX}] \equiv [\text{K}^+ \text{ EFFLUX}]$

PHASE 3 :- RAPID REPOL. PHASE $\Rightarrow$ $\cdot$ L-TYPE Ca^{2+} CHANNEL CLOSE
 $\cdot \text{K}^+$ CHANNEL OPEN
 $[\text{K}^+ \text{ EFFLUX}]$

PHASE 4 :- RESTING MEMB. POT. $\Rightarrow$





SYMPATHETIC STIMULATION

of SAN

NOT EPINEPHRINE

↓

STIMULATE β -1-ADRENERGIC RECEPTOR

↓

PERM. OF Na^+ & Ca^{++} ↑

↓

DEPOLAR. EFFECT OF FUNNY CHANNEL ↑

&

Ca^{++} INFUX THROUGH L-TYPE CHANNEL ↑

↓

RATE OF SPONTANEOUS DISCHARGE ↑

PARASYMPATHETIC
OR VAGAL STIMULATION

ADH. RELEASE FROM VAGAL
NERVE ENDINGS

↓

K^+ CONDUCTANCE OF NODAL
TISSUE ↑

↓

MEMBRANE HYPERPOL.

↓

SLOPE OF PREPOTENTIAL ↓

