CT3 - BIO

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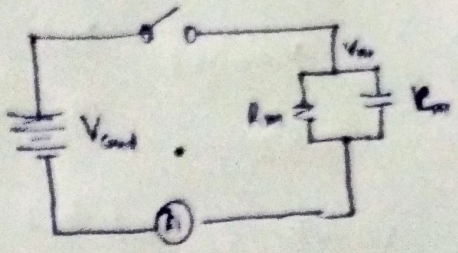
2K19/EP/005

1

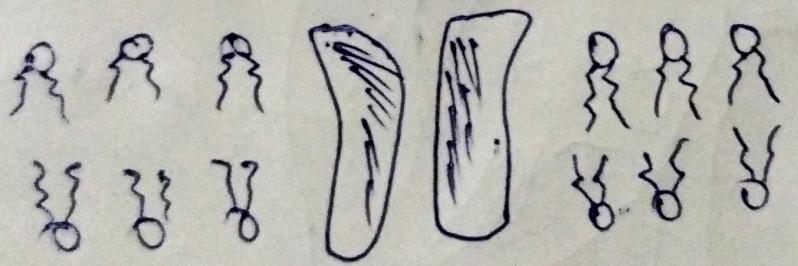
a. voltage-clamp experiment,



are controls the membrane voltage in a cell and measures the trans membrane current required to maintain that voltage. The ideal voltage-clamp circuit simply consists of a battery, a switch, a wire, cell and an ammeter.

→ When switch closes, the membrane potential drops instantly to the battery voltage, $V_m = 0$.

→ There is a impulse of current injecting a charge $q = C_m V_{bat}$.



cell membrane acts as a capacitor

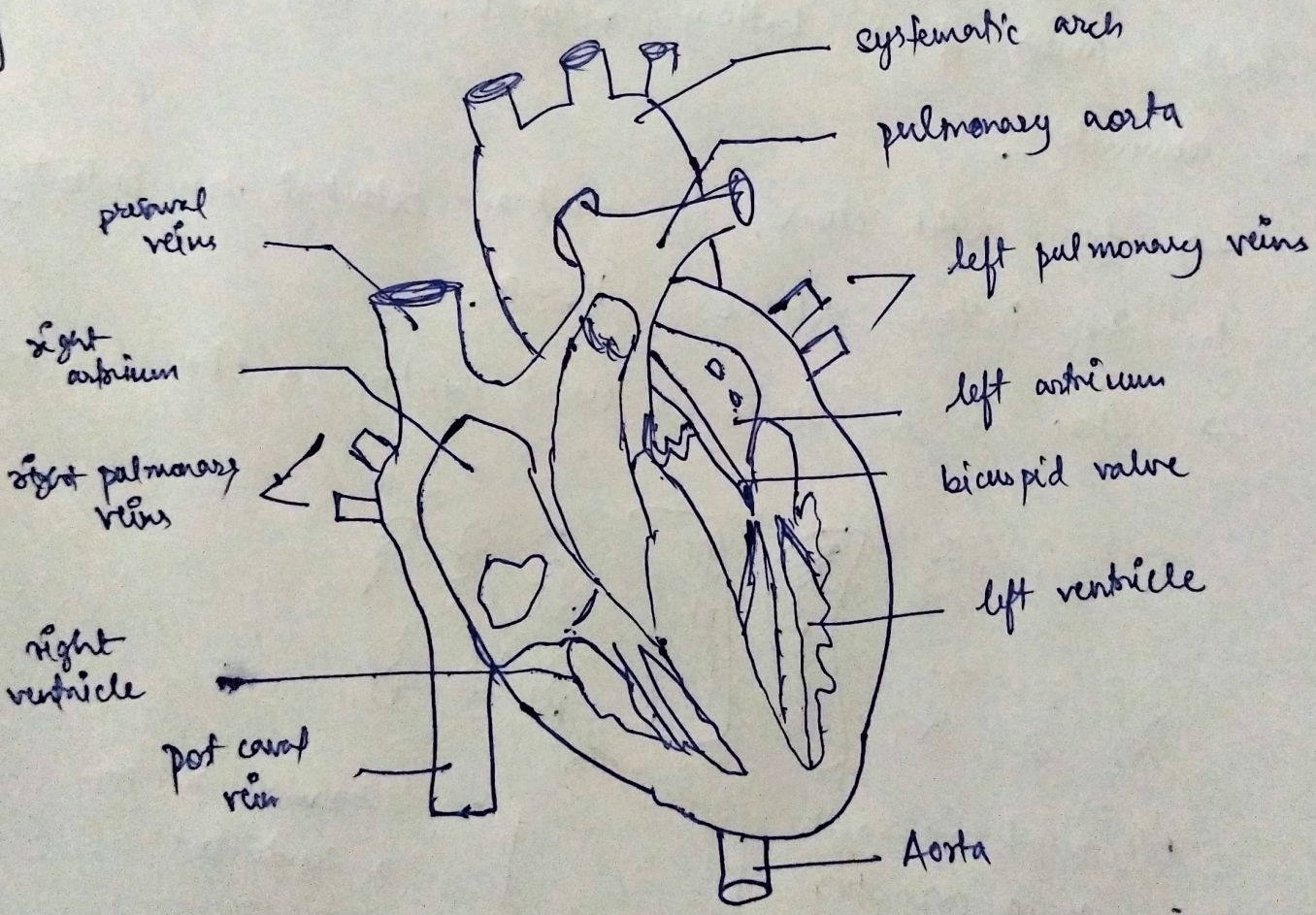
ion channel acts as a conductor

2

a) Sub modelling is the technique of studying a local part of a model with refined mesh, based on interpolation of the solution from an initial, global model into appropriate parts of the boundary of the submodel.

6) Due to recent advances in methods, software and hardware, crystallographic structure determination no longer requires a specialist in the method, but rather it has become a technique that can be readily applied to many research problems. It needs to know how to evaluate structural models, understand how they are related to experimental data, and utilize computer graphics.

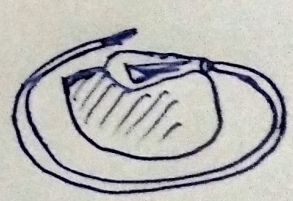
3



(4)

Sensory Neurons	Motor neurons
→ carry sensory impulse from sensory organs to central nervous system.	→ carry motor impulses from central nervous system to specific effectors.
→ located in the dorsal root ganglion of spinal nerve.	→ located in the ventral root ganglion of spinal cord.
→ it is unipolar.	→ it is multipolar.
→ 10 million sensory nerves in body.	→ Half a million neurons found in body.

(5) Pacemaker is a small, battery operated device, which senses when your heart is beating irregularly or too slow. It sends a signal to the heart that makes heart beat at the correct pace.



Most pacemakers have 2 parts:

↳ the generator contains the battery and information to control the heartbeat.

↳ the leads are wires that connect the heart to the generator and carry the electrical messages to the heart.