
DNA
لجنة طلبة الأحياء و التكنولوجيا الحيوية

تلخيص مادة

Lab Bio 1

Seham qamadilo

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Lab1: Microscope

* parts of the compound light microscope and their function:-

1. Base → it contains the sourse of illumination (light source = illuminator)
   ① Carries all parts of the microscope.
   ② Used to carry and move the microscope.

2. Arm → ① used to grasp the microscope when moving it
   ② holds stage and lens system
   ③ binds them to the base

3. Mechanical Stage → metal pieces used to move the slide on the stage

4. Clip → metal piece used to fix the slide in place

5. Stage manipulators → Two knobs used to move the mechanical stage in all direction (along with the attached slide)
   Note:- stage manipulators may be separated in some models or placed over each other in other models.

6. Stage → ① holds slides
   ② there is a central hole in the stage to allow passage of light through the slide

7. light source (illuminator or illumination Source):-
   ↳ a light bulb located on the base beneath the condenser.

8. Condenser → lens system above the light source and below the hole in the stage, it may be fixed or adjustable by a knob
   used:- it concentrates light passing the specimen placed on the slide.

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[9] Iris diaphragm → located : over the consender
Composed : from a series (سلسلة) of over lapping (تلف) metal plates form its an adjustable hole through which light can pass
used → it controls, using an Iris diaphragm lever, the amount of light passing through the specimen and then passing your eyes
Notes :-
- for unstained (غير ملون) or lightly stained slides dim (خافت) light is best.
- for dark slides bright (ساطع) light is best
- less light is needed with low power lens and vise verso (والعكس بالعكس)

[10] Objective Lenses : → placed : directly over the object (specimen) on the slide
(4X, 10X, 40X, Oil immersion lens (100X))
* Normally four lenses but some microscopes have more
* Reract Light forming magnified image (4X, 10X, 40X, 100X) for the object
⇒ The magnification power for each lens is indicated on it's side
** Total magnification of any microscope = the magnification power of the Objective * the magnification power of ocular lens used.

[11] Ocular (eye piece) Lens (one lens in monocular microscopes or two lenses in binocular microscopes)
① Usually has a magnification power of 10X
② It further (اضافي) magnifies the image formed by the objective lens
③ It projects the final magnified image of the object to the eye piece.
④ It contains a hair or metal arrow (سهم) called the pointer (الموشر), moves with the ocular lens as it is rotated (استدارة) and used to magnificate at specific (معين) structures

Lab(1): microscope.

12 Revolving nosepiece → ① carry objective lenses
→ ② Revolving (rotating) it allows selection of a particular objective lens.
→ ③ As you rotate it the objective lens must be "clicked" into place for an object to be visible.

13 Body tube → ① the part of the microscope that holds the oculars
→ ② contain filters
→ ③ prisms that clear the image and direct it to the ocular lenses

14 Coarse adjusment Knob → ① image focusing by raising and lowering the stage in Large distances to adjust the distance between the stage and the objective lens
→ ② to bring the slide into focus

15 fine adjusment Knob → image sharp focusing by raising and lowering the stage in very little distances to adjust the distance between the stage and the objective lens.

Note: fine and Coarse adjusment Knobs may be Separate in Same models or placed over each other in other model.

16 power switch → Located on the microscopes base used to turn on or off the light bulb

Day 12 / 10 / 2014 lab 2 : The Organization of cells

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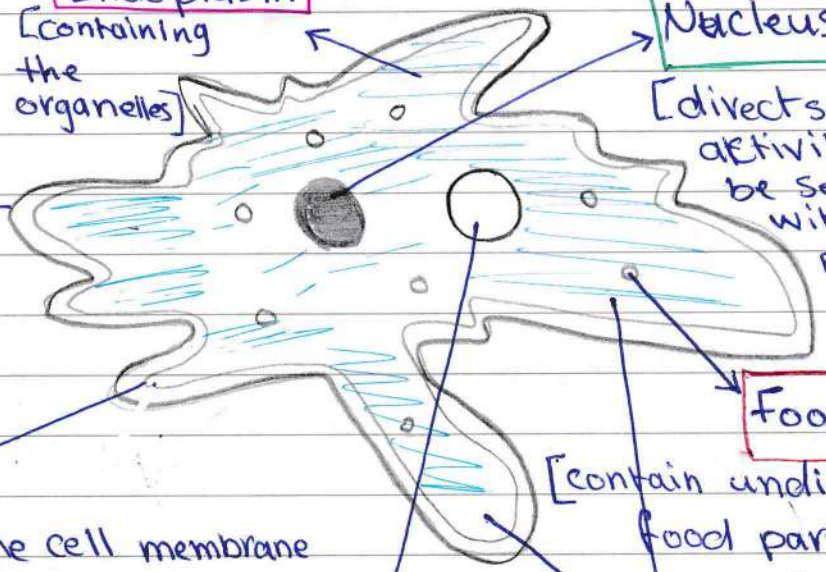
Cells:-

*eukaryotic
- membrane bounded organelles
- Animal, plant, protista, fungi, algae

*prokaryotic
X
- bacteria

① Unicellular ⇒ (Single cells) [Amoeba] → respiration, digestion, reprodution, excretion
② Aggregate = clusters = colonies → cells are independently; any cell separated can grow to new colony
③ Multicellular → group or cluster of cell dependent on each other → Somatic cells and sexual cells (reproduction)

① Ameoba

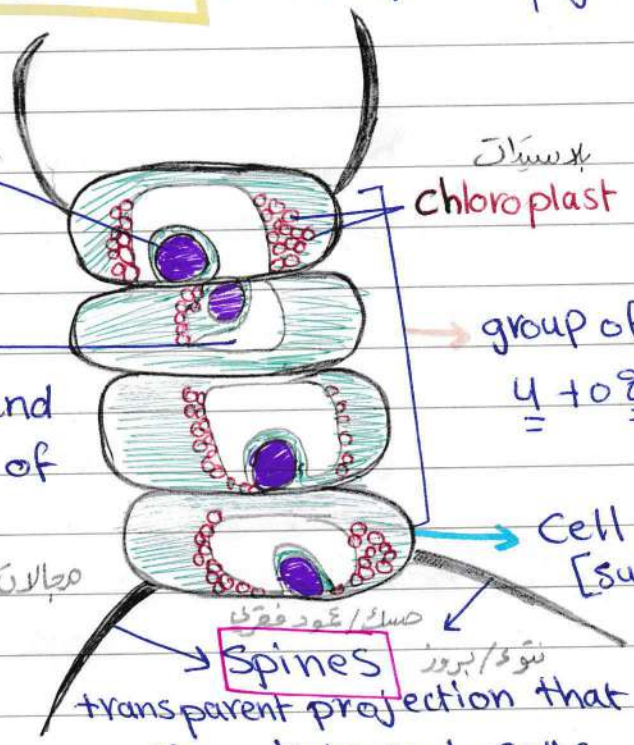


Remark ⇒ Uni cellular eukaryotic maybe autotrophic or heterotrophic

② Aggregate and colonial Organisms

⇒ Colonial organisms are cells that live in groups and are to some degree dependent on one another.

* Example → Scenedesmus ~~> aquatic green agla



Nucleus كروي
Spherical, approximate middle of each cell

Vacuole
transparent spheres that tend to occur at either end of the cells
مجالات شفافة، تميل الى ان تحدث على طرفي الخلايا

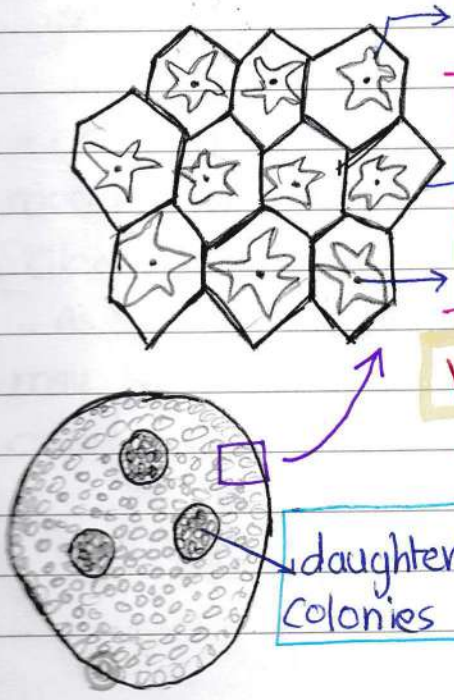
بلاستيدات
chloroplast

group of from 4 to 8 cells

Cell Wall [surround each cell]

حسك / عمود فقري
Spines شوك / بروز
transparent projection that occur on the two end cells

③ Multicellular Organisms



→ cytoplasmic strand
→ Cell wall
→ Nucleus

* There are two or more cell types with specialized (متخصصة) structure and function that cannot persist (يستمر) when isolated from other cell organism
* 500 to 50000 non-reproductive Somatic cells خلايا جسمية غير تناسلية

VOLVOX
↳ is an aquatic green agla
↳ For a sexual reproduction

daughter colonies

* The individual cells are interconnected by cytoplasmic strand to form a sphere
* these cells have chloroplast for photosynthesis and flagell that beat in a →

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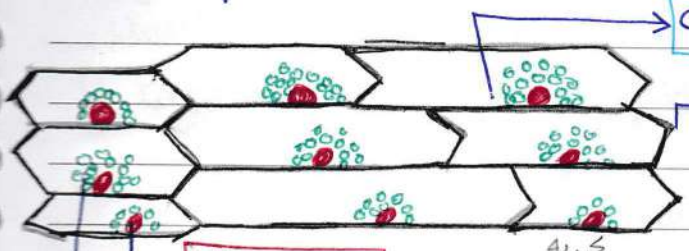
plant Cells:-

Example ⇒ Onion Cells



→ cytoplasmic strand

→ cell wall → rigid (قاسي/صلب), surround plant cell give the cell ① the definite Shap ② support [it contain cellulose]

→ Nucleus → spherical (كروية), transparent (شفافة), organelle (عضية) within the cytoplasm, it controls cell metabolism (الأيض ← تفاعلات كيميائية) and division

→ chloroplast

* cell wall not found in animal cells

* protoplasm ⇒ is the Organized contents of the cell, exclusive of the cell wall

* Cytoplasm ⇒ is (the proto plasm) of the cell, exclusive of nucleus.

* The central vacuole ⇒ is a membrane-bound (معقد) sac (كيس) within the cytoplasm that is filled with water and dissolved substance (مادة ذائبة), this structure serves to:
  - store metabolic (الأيضية) wastes
  - give the cell support by means of turgor pressure (الضغط المنتفخ)

** Animal cells also have vacuoles, but they are not as Large and conspicuous (واضحة) as those found in plants.

* chloroplasts ⇒ are the green, spherical organelles often (غالبا) Seen moving within Cytoplasm [these Organelles carry pigment clorophyll ⇝ that involved in photosynthesis] ⇒ Function of chloropla

* As microscope light heats up the cells, cytoplasm and chloroplasts may begin to move around the central vacuole in a process (عملية) called (cytoplasmic streaming) or cyclosis (دوران الهيولى)

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* Animal Cells

- Animals are multicellular heterotrophic organisms that ingest organic matter

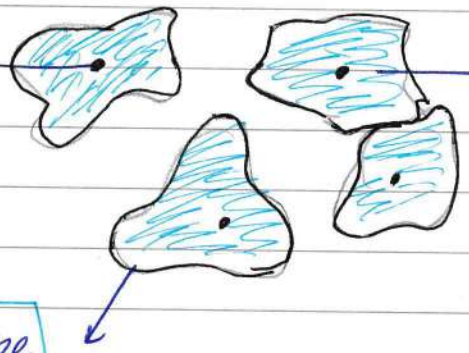
- Multicellular Composed of cells that can be categorized into 4 major tissue groups
  1. epithelial
  2. connective
  3. muscle
  4. nervous tissue

* epithelial cells ⇒ occur on the outside of animals and serve to protect the animals from 1) water loss
  2) mechanical injury
  3) foreign invaders

* Similar to epidermal cells in plants

* epithelial cells occur in animals in the interior cavities and ducts

* Example → cheek epithelical cells



Nucleus
near the middle of the cell

cytoplasm
is the granular contents of the cell, excelusive of the nucleus

cell membrane
Separates the cell from its surrounding

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* Organelles : plastide

Chloroplast
- Green
- in all plant
- function : photosynthesis, storage chlorophell

chromoplast
- in some plants
- function: colouring storage pigment

leucoplast
function : storge starch

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Lab 3:-

Diffusion and Osmosis

* The cytoplasm and extracellular environment of the cell are aqueous solution.

* Cytoplasm and extracellular: 1) composed of water ⇝ which is the solvent
2) dissolving agent
3) numerous organic and inorganic molecules ⇝ which are the solutes
4) dissolved substances

* Organelle membrane and the plasma membrane are Selectively permeable → allowing water to freely pass through
→ regulating the movement of solutes

* The cell actively moves some dissolved substances across membranes
① expending adenosine triphosphate (ATP) to accomplish the movement.
② Other substance move passively, without expenditure of (ATP) from the cell → only if the cell membrane is permeable to those substance

* diffusion :- a physical process in which molecules move from an area where they are in high concentration to one where their concentration is lower
↳ Example of diffusion → water and selected solutes move passively through the cell and the cell membrane.

* The energy driving diffusion comes only from the [intrinsic kinetic energy] (energy of motion) in all atoms and molecules.

* if nothing hinder the movement, a solute will diffuse until it reaches equilibrium.

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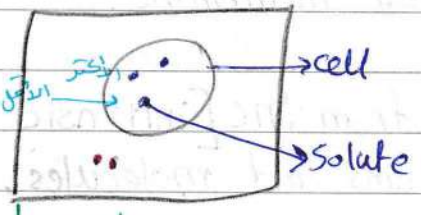
* Osmosis ⇒ a type of diffusion, in cells it is the diffusion of water through selectively permeable membrane from a region where it is highly concentrated to a region where its concentration is lower.

* The difference in concentration of water occurs:-
  - ① if there is an unequal distribution of at least one dissolved substance on either side of a membrane.
  - ② the membrane is impermeable to that substance.

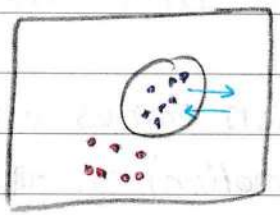
- example ⇒ if a membrane that is impermeable to sucrouse Separates a solution of sucrose from distilled water, water move from distilled water (Higher Concentration) through the membrane into sucrose solution (lower concentration)

* Three terms: hypertonic, hypotonic, isotonic — are used when refering to two Solution separated by selectively permeable membrane.

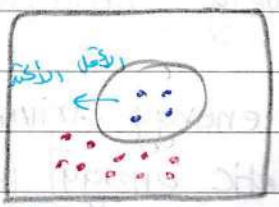
- hypertonic Solution: has a greater concentration of non penetrating Solutes than the solution on the other side of the membrane [greater Osmolarity]
- hypotonic Solution: has a lower concentration of non penetrating Solutes than the solution on the other side of the membrane [lower osmolarity]
- isotonic solution: the concentration of non penetrating is equal on both Sides of the membrane



hypotonic



isotonic



hypertonic

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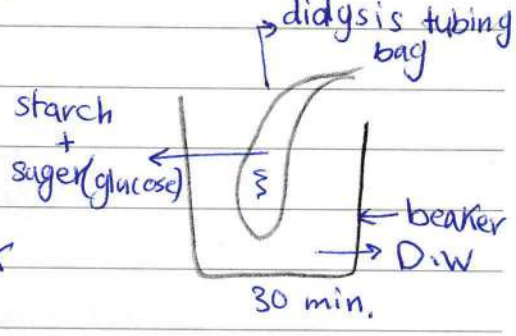
* Diffusion of molecules through a selectively permeable membrane

Dialysis tubing: is a membrane made of regenerated cellulose fibers formed into a flat tube

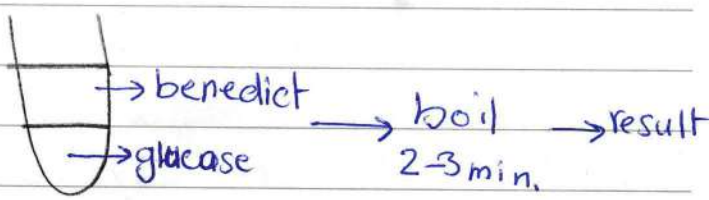


① Iugo's reagent :- [$I_2 + KI$ = Iodine]

* Iugo's + Starch ⟶ purple or black

* Iugo's + nonstarch ⟶ yellow [pale yellow - amber color]
اصفر شاحب

② Benedict regeant



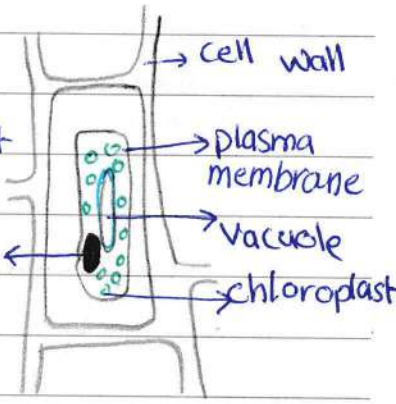
* green ⟶ Orange ⟶ Orange-red ⟿ (reducing suger is present)
تفاعل مستوى السكر موجود

* blue ⟿ (No reducing suger is present)

* Osmatic behavior in cells with a cell wall :-

when a plant cell is placed in hypertonic solution.

* plasmolysis: water moves out of the cell, the protoplast shrinks and may pull away from the cell wall.
Cell described ⟶ (plasmolyzed)



* protoplast: the plant cell exclusive of the cell wall - the cytoplasm enclosed by plasma membrane.

* turgor pressure: pressure of the protoplast on the cell wall owing to uptake water.

① animal cell ⟶ swell ⟶ lysis
② plant cell ⟶ swell ⟶ Turgid

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Lab4 / Enzymes

*Enzyme: are biogical catalysts, compounds that speed up chemical reaction without being used up or altered in the reaction.

*Substrate: the material with which the catalyst reacts is modified during the reaction without to form a new product.

* Enzymes lower the energy of activation needed for reactions to take place, they accelerate the rate reactions.
* They don't determine the direction in which a reaction will go or its final equilibrium.

* Enzymes activity ⇝ influenced by many factors { PH, temperature

may change three dimensional shape of an enzyme and alter it's rate of activity.

* specific chemicals may also bind to an enzyme and modify its shape

* Activitors: Chemicals that must bined for the enzyme to be active
* Cofactors: are nonprotein substances that usually bind to the active site on the enzyme and are essential for the enzyme to work
  - Organic cofactor called ⇝ [coenzymes]

* Inhibitors:- chemicals that shut off enzyme activity,

Inhibitors → Competitive inhibition
Inhibitors → Non competitive inhibition

* illustrating enzyme activity:
  1. determine the rate of disappearance of the substrate
  2. determine the rate of appearance of the product

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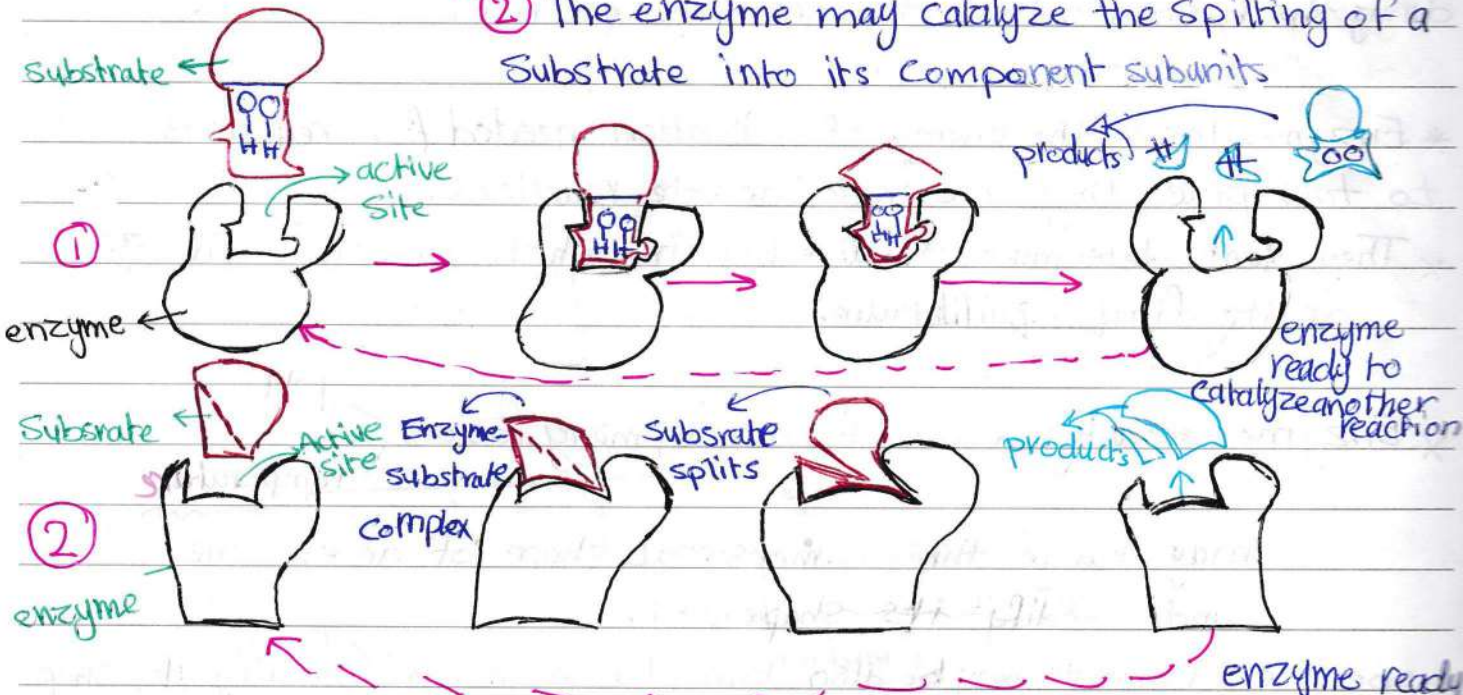
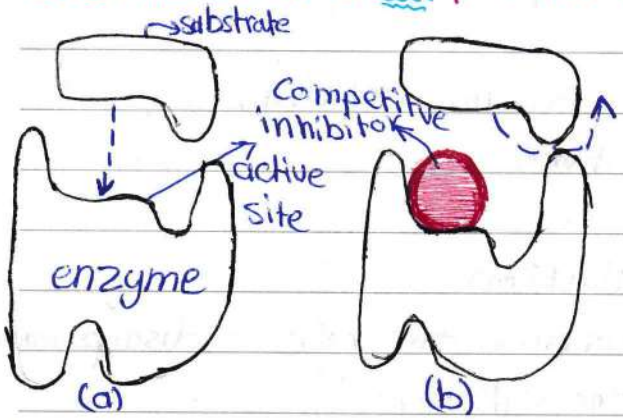
** Enzyme activity
① The enzyme may catalyze the addition or removal of a molecule or portion of a molecule from the substrate to produce the product
② The enzyme may catalyze the spilting of a substrate into its component subunits



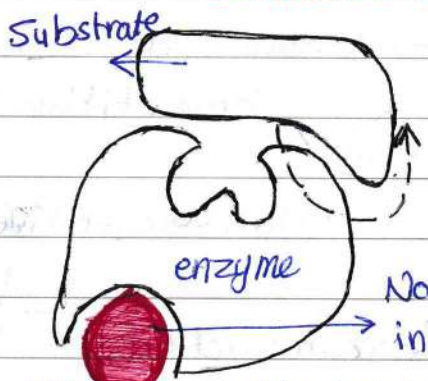
** An Inhibitor molecule affects an enzyme in two ways :-

① Action of a competitive inhibitor :-



(a) Substrate normally can bind to the active site of an enzyme.
(b) a competitive inhibitore mimics the substrate and competes for the position at the active site on the enzyme.

② Action of non competitive Inhibitor :-



* The non competitive inhibitor binds to the enzyme at a location away from the active site, either blocking access to the active site or changing the conformation of the enzyme rendering it inactive.

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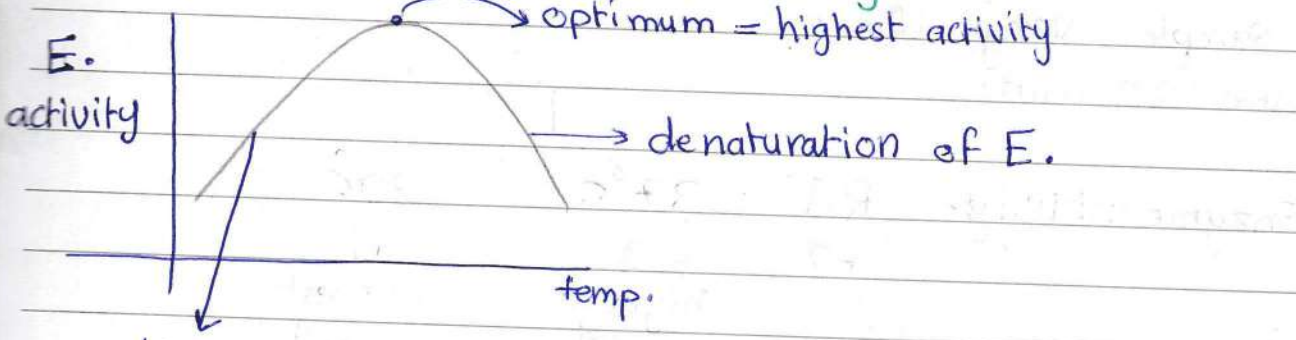
* Competitive inhibition can be reversed if the concentration of substrate is raised to sufficiently high levels while the concentration of the inhibitor is held constant
* Non competitive inhibition the inhibitor can become unbound reversing the inhibition. Unlike competitive inhibition adding additional substrate will not revese the inhibition.

** Effect temperature on enzyme activity :-

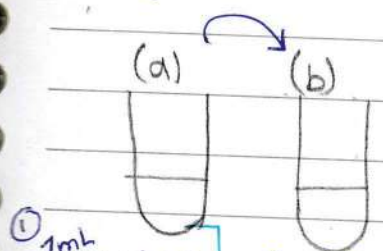


Kinetic energy ↑ → collision between Substrate + enzyme ↑ → enzyme activity ↑

Ex (4.3) :-

* starch $\xrightarrow{\text{amylase}}$ maltose $\xrightarrow{\text{other E}}$ glucose
2-glucose unit

* Amylase found in → saliva in animals and humans



① 1ml amylase
② 5 drops of buffer pH = 7.0

① 2ml starch
② 4ml D.W

→ at certain temp. for 10 min → separated then put tube (a) → tube (b)

** put like this tubes in three different temp.
① at room temperature
② 37°
③ 80°
] water bath

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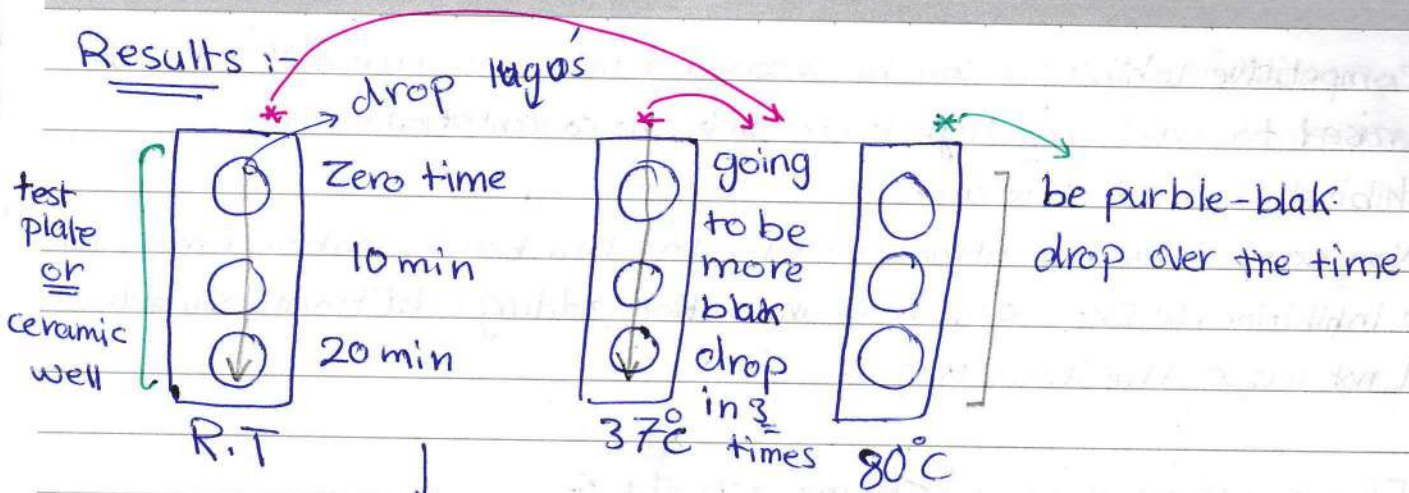
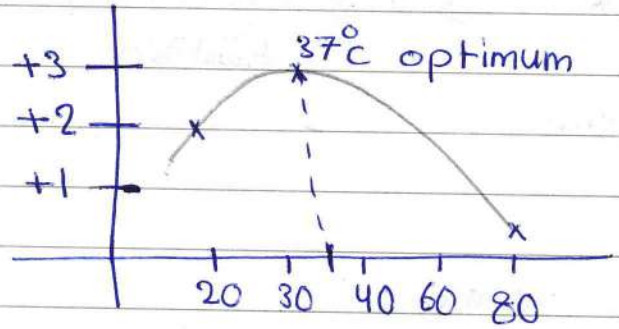
Results :-



- take sample every 10 min
- max time 20 min

** Enzyme activity- R.T +2 | 37°C +3 highest speed | 80°C +1 lowest speed



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Lab "6" :- photosynthesis

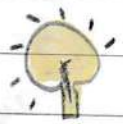
* In photosythesis light energy is trasformed into chemical enery. That chemical energy is used to synthesis organic compounds (glucose) from CO_2, and in the process water is used and O_2 is released.

* $6CO_2 + 6H_2O \xrightarrow[\text{chlorophel}]{\text{ATP + Light}} 6O_2 + C_6H_{12}O_6$

into chloroplast ← ; O_2 ↓ important for aerobic respiration التنفس الهوائي

* Glucose ($C_6H_{12}O_6$) a primary source of energy for all cells, may be converted to sucrose and transported or (stored in the polymer strach)*. There organic molecules are building blocks for plant growth. Animals consume plants and convert the plant molecules into their own organic molecules of energy Sources (the ultimate in recycling)

* The visible light from the sun may be reflected (تنعكس), transmitted (تنفذ) or absorbed (يمتص). plants [absorb] light energy and convert it to chemical energy during photosynthesis.



Remember :-

The energy in organic molecules is released to form ATP during cellular respiration. On the other hand, energy is absorbed (consumed) during photosynthesis process.

* $C_6H_{12}O_6 + 6O_2 \longrightarrow 6H_2O + 6CO_2 + \text{Energy (ATP)}$

Cellular respiration

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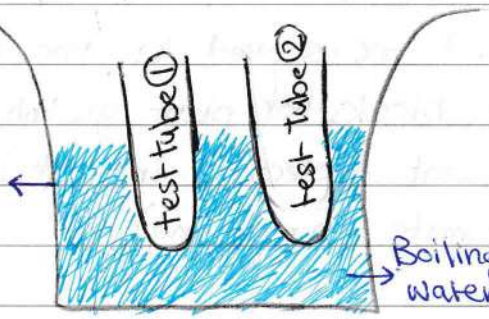
* Exercise 6.1 page 132 :- [The wavelength of light from photosynthesis

* producer → plant, algae, cyano bacteria (البكتيريا الخضراء المزرقة)

producer ⇒ Organisms that perform photosynthesis

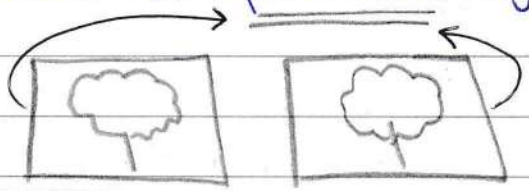
[1] we will use two papers of (Geranium plant), the first one was exposed to bright light So there is a starch (glucose) in it comes from photosynthesis process ~~was~~. The other one was covered and photosynthesis process was not allowed.

[2]

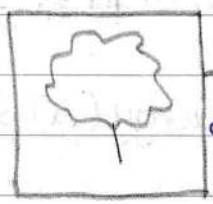


* we put the 2 papers (leaves) into the test tubes that contain (alcohol) ethanol to remove the chlorophyl green colour.

[3] we put the 2 leaves in a petri dish by using forceps



[4] Now we use Iodol's solution indicate to presence of starch:



→ it returns into purple black color that means the leaf contain starch, it was exposed to light (photosythesis is active)

→ it returns into yellowish brown. (No photosynthesis)

* pigments in photosynthesis :-

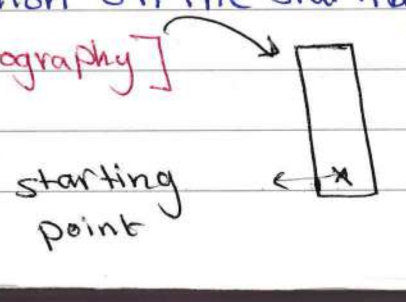
* A pigment is a substance that absorbs light. IF a pigment absorbs all wave lengths of visible light, it appears black.
Yellow pigments, for example, reflect light wavelengths in the yellow portion of the visible light Specturm, and so on.
- الصبغة يظهر لونها من خلال امتصاص الألوان ذات الأطوال الموجية المختلفة وعكس لونها فقط.

* Some colours are produced by only one pigment, but an even greater diversity of colors can be produced by the cumulative (تراكم) effects of different pigments in cells

* Green colors in plants produced by → chlorophylls a and b Located in the chloroplasts.

* Yellow, orange and bright colors → produced by carotenoids, also in chloroplast
* Blues, violets, purple, pink and dark ~~colour~~ red → produced by a group of water-soluble pigments, the anthocyanins, located in cell vacuole and don't centribute to photo sythesis,
المجموعة الأخيرة التي تحتوي على الأزرق ومشتقاته اسمها (anthocyanins) مسؤولة عنها صبغات ذائبة في خلية، وهذه المجموعة لا تدخل في عملية البناء الضوئي

☒ Separation and Identification of plant pigments by thin layer chromatography
1. Use spinach leaf مهم جدا "اسم النبتة المستخدمة"
2. Use Mortar and pestle to rupture the spinach cells, then mix it with aceton to make pigment Solution
3. put drops of the solution on the starting point of [Thin layer chromatography]



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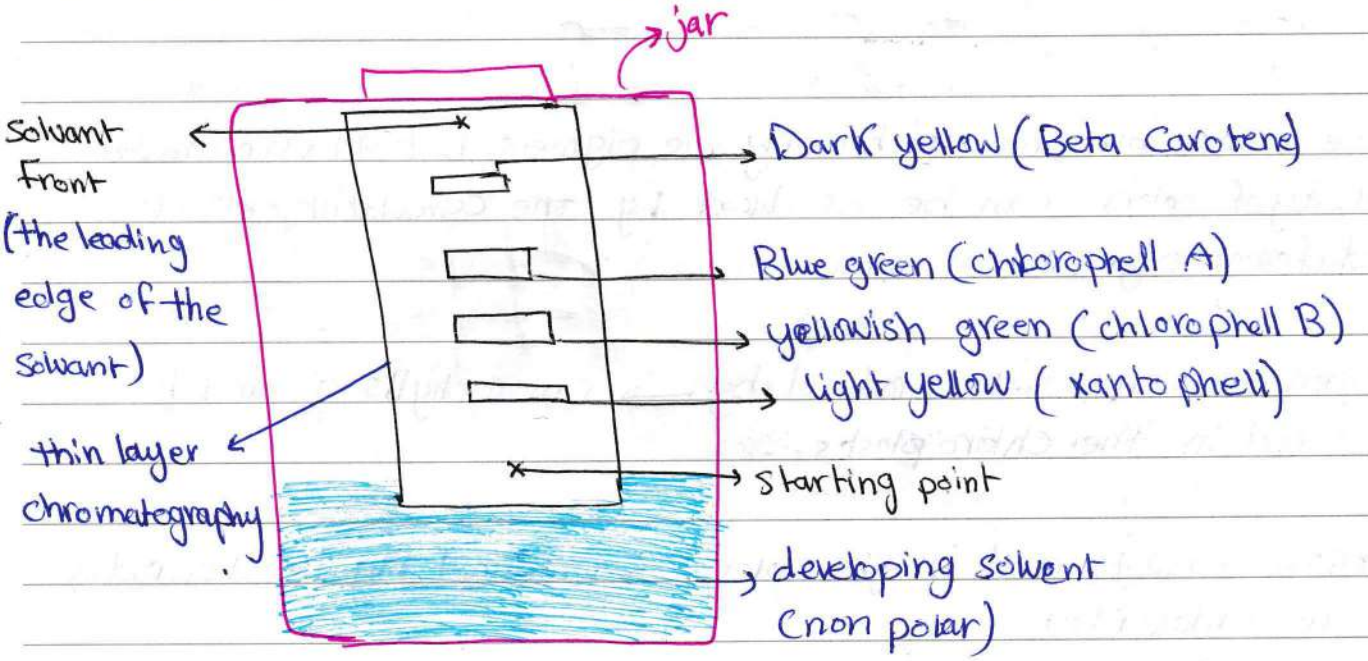
4 put the thin layer chromatography into a coverd jar with orgnic solvant petroleum (developing solvent) that contain hexans, aceton, ethyL

* The solvant will move up the paper and carry the pigment along (the pigment will move of different rates depending on different solubilities in the solvants) حسب اختلاف ذائبيتها



1 you have to know that (thin layer chromatography) made of cellulose [white side] and SiO_2 [silver side] and it's polar

2 The most polar molecule is (Xantophell) will be attracted ~~with~~ to the polar thin layer chromatography, it will be move last

3 The most non polar molecule is (Beta Carotene) will dissolve in the non polar solvent first and move with the solvent for the top of thin layer

DNA الجينة

Lab 7: Mitosis and Meiosis

* Genes: discrete units hereditray (وراثي) information of duplicated deoxyribonucleic acid (DNA).

* Genes are located in cells of eukaryotic organisms and they contain chromosomes.

* structural proteins in the chromosomes :- two function ⇒
1. organize DNA
2. participate in DNA folding and Condensation (تشارك في عليه طي DNA وزيادة تكثيف)

* when cells divide, chromosomes and Genes are duplicated (تتضاعف) and passed on (تنتقل) to daughter cells. (أثناء الانقسام تتضاعف الكروموسومات في الخلية الأم وتنتقل للخلايا الجديدة)

* why do cells divide ??
1. single-celled organisms divide for reproduction.
2. Multi cellular organisms divide for

- reproduction by reproductive cells (eggs or sperm) (الجيوفات الجنسية)
- growth or replacement by somatic (body) cells

* Mitosis: is the cell cycle process by which chromosomes in a cell nucleus are separated into two identical sets have the same number of chromosomes and the same genes as the parent cell

Somatic cells
- for example (epidermis or outer layer of skin tissue)
- divide by mitosis

Single-Celled organism
- for example (yeast, ameoba) (الخميرة)
- can repreduce asexually through mitotic divisions to form additional organisms (genetically identical clones)

Day / /

DNA _ لجنة

* Cancerous cells :- They are characterized by uncontrolled mitotic and cell division.

* What is "Telomeres" ?

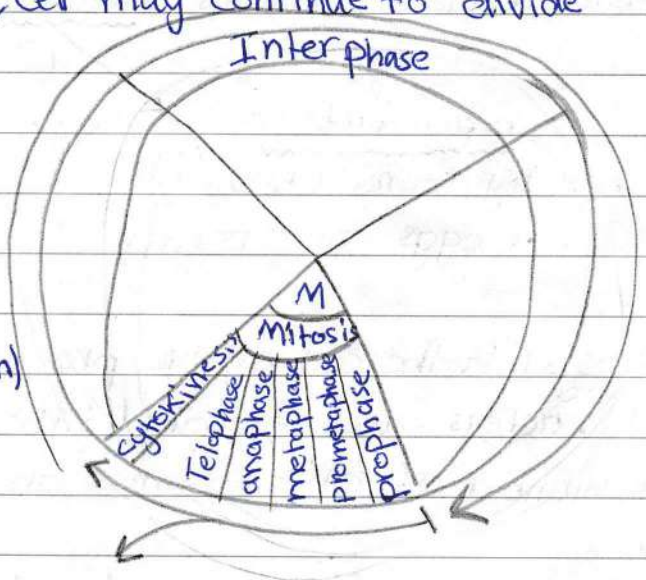
Telomeres are DNA squences on the ends of chromosomes that become shorter during every mitotic cycle of somatic cel

* What is importance of telomeres?

1. without telomeres protecting the chromosome ends, so importa genes located at the ends of chromosomes might be lost in mitos
2. limites number of mitotic cycles

* What is the relation ship between telomeres and cancers?

if telomeres fail to shorten, cell may continue to divide as in cancer cells



* figure 7.1 page 152

In multicellular organisms (in preparation for sexual reproduction) a type of nuclear division called meiosis take place.

In meiosis:-

1. certain cells in ovaries or tests (or sporangia in plants) divide twic
2. chromosomes only replicate once
3. the process results in the four daughter nuclei with new combinat of the chromosomes.
4. Eggs or sperm (or spores in plants are evantually formed

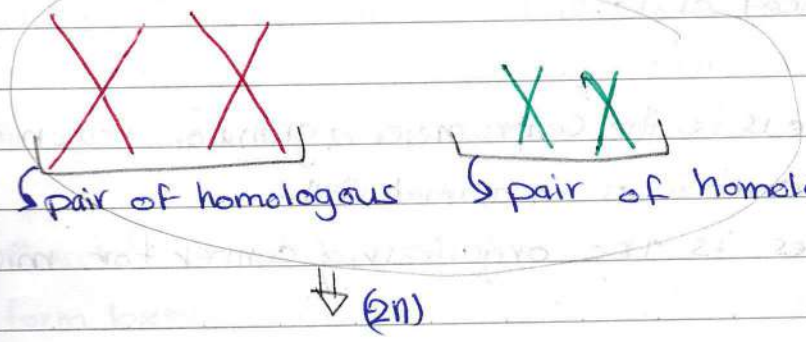
Day / /

DNA_لجنة

*cell cycle ⇒ is the event from the beginning of one cell division to the be beginning of the next

* Meiosis (→ for reproduction)	* Mitosis (→ for growth or replacement)
- The process of meiosis contributes to the genetic variation that is important in sexual reproduction	- The daughter cells have the same genes as the parent cell.
- The process results in the 4 daughter nuclei	- only 2
- it take plase in the reproductive cells	- it takes place in body cell
- cells formed are haploid (n)	- cells formed are diploid (2n)
- after nuclear division the cytoplasm divides a process called (cytokineses)	← - the same
- Two divisions occur	- only one division

* Diploid cell (2n) has (4) chromosomes that means (2) homologous pairs of chromosomes



Day / /

DNA_لجنة#

* Homologous chromosomes are ① the same Length
② the same centromere position
③ contain genes for the same characters

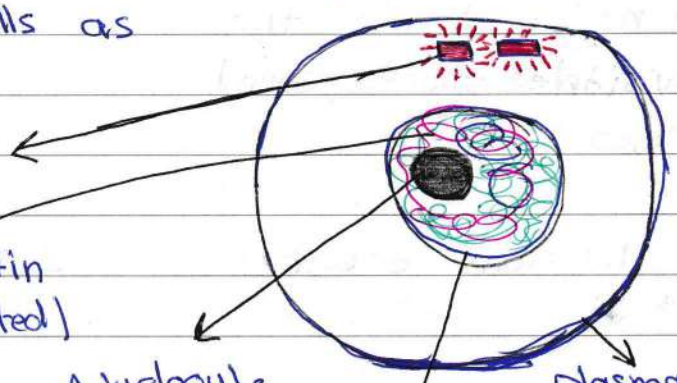
* One pair will be long chromosomes, the other pair short

* cell cycle ⇒ divided into 2 major phases ① inter phase ② miotic phase(M

① inter phase ; a cell performs its specific functions

- Live cells produce bile
- skin cells produce keratin
- intestinal cells absorb nutrients
- pancreatic cells secrete enzymes

* As interphase begins there is approximately half as much cytoplasm in each cells as there was before division.



* the genatic material in interphase step is (chromatin) which is uncoiled or decondenced state, غير ملفوفة والكروموزمات عشوائياً وتكون مرنة وطويلة

* out side the nucleus is the centrosome, a granular region that contains apair of centrioles in animal cells.
(The centrosomes is the organizing center for microtubules)

Day / /

DNA _ #لجنة

* 3 stages of Interphase :- تتميز بوجود نواة أو أكثر

1 G1 → (a) the cytoplasm mass increases and will continue to do so through.
(b) proteins are synthesized
(c) new organelles are formed and some organelles such as mitochondria and chroloplasts grow and divide in two
* centriole duplication begins in Late G_1 or early S.

2 S → (a) Duplicate the chromosomes to represent DNA replication.
(b) synthisis of chromosomal proteins (DNA synthesis continues until chromosomes have been duplicate)

* Each strand of adublicated chromosome is called sister chromatid
- sister chromatids are identical to eachother and are held together, tightly at the centromere.

3 G_2 → cells prepare for mitosis. Enzymes and other proteins necessory for cell division are synthesized.

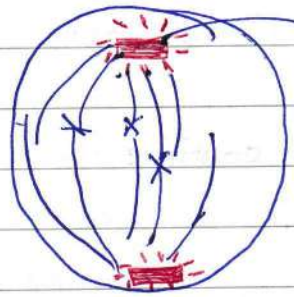
2 Mitosis phase (M) ⇒ the nucleus of cytoplasm divide
* Nuclear division is called Mitosis
* cytoplasmic division called cytokinesis

* Mitosis is divided into Subphases:- (تختفي النواة والنيوكليول يقترب ليصل للأقطاب وتنتج spindle ويتحلل الغلاف النووي)

A prophase
* prophase begins when chromosomes begin to coil and condense.
* centriols continue to move to apposite poles of the nucleus. (تبدأ خيوط قوية بضبط الجهل لتكون كروموسوم بسيط)
* fibrous rounded structure tapering toward each end called spindle begin to form between centriols * Nucleoli begin to disappear

Day / /

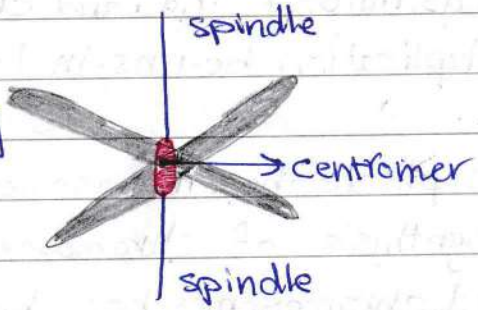
#لجنة_DNA



spindle pole (spindle extend from the chromosome to the centrosome at the poles)

* Some spindle fibers become assoc. ted with chromosomes at protei structures called [Kinetochore]

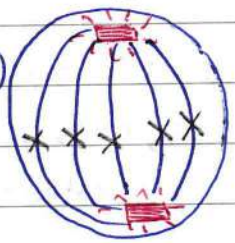
[the red point are Kinetochores]
وهو مكان التقاء ال spindle بالكروموسوم



* ملاحظة :- تتم دمج مرحلة prophase وال prometaphase لأنهم مكملات لبعض
(كأنهم مرحلة واحدة prophase)

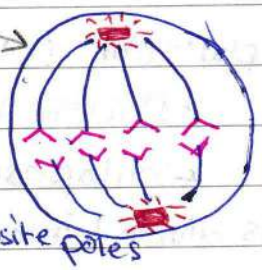
B metaphase :- [The push and pull of spindle fiber on the chromosome ultimately leads to their movement to the equater]
حركة الكروموسومات للمنتصف
حط الاستواء]

* In metaphase (static phase) الطور الاستوائي
duplicated chromosomes lie تصطف on the equator (membrane plate)
The two sister chromatids are held together at the centromere.



* Metaphase ends as the centromere splits تنفصل

C Anaphase → ① centro metic division
② sister chromatids separate and begin tomove toward apposite poles
③ chromatids are now called chromosomes

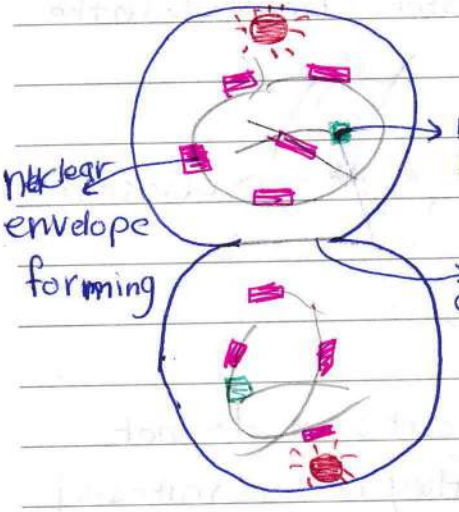


* Anaphase ends as the chromosomes reach the poles

DNA_لجنة

C Telophase ⇒ ① The spindle begins to break down
② chromosomes begin to uncoil
③ nucleoli reappear
④ A nuclear envelope forms around each new cluster of chromosomes

*Telophase ends when the nuclear envelopes are complete

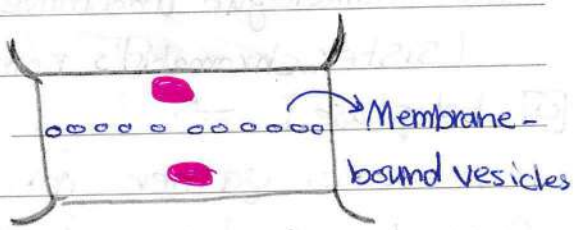


*[cytokinesis] ⇒ occur the end of telophase (the end of nuclear division or mitosis)
↳ results in the formation of two separate cells. In cytokinesis in animal cells, fungi and slime molds a cleavage furrow forms at the equator and eventually pinches the parent cell cytoplam in 2

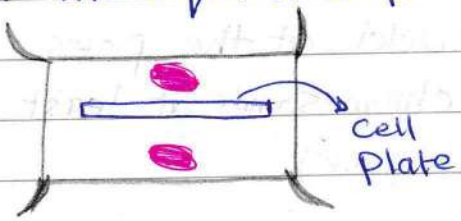
* cleavage furrow consist of Actin and myosin

[*] In plant cells :-

① membrane-bound vesicles migrate to the center of the equatorial p.

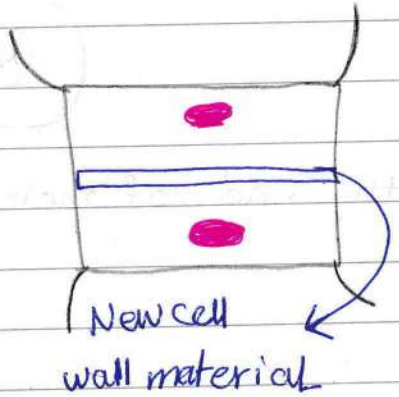


② Vesicles fuse to form the [cell plate]



③ cell plate extends across the cell, dividing the cytoplasm in 2

④ cell wall materials in the vesicles are released into the space between the membrane of the cell plate forming the new cell wall



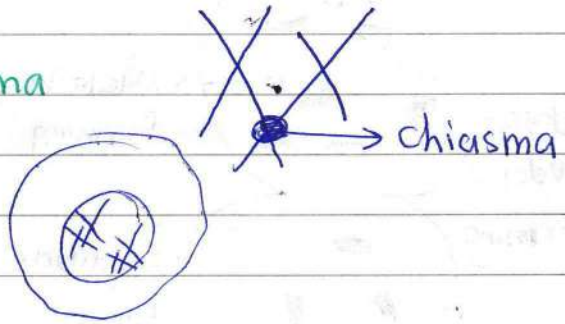
Day / /

DNA - لجنة

meiosis I

[1] prophase I ⇒ each chromosomes find its homologue and pairs in tight association in process called [synapsis] forming duplicated chromosome complex made of 4 strand called tetrad byvalent XX

* Crossing over ⇒ takes place between non sister chromatid in the tetrad.
* The cross over site forms a chiasma

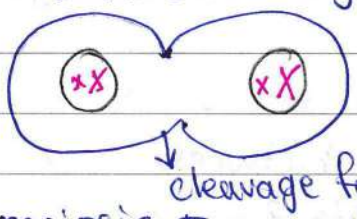


[2] metaphase I ⇒ tetrads lying in the equater [centromere do not split as they do in mitosis]

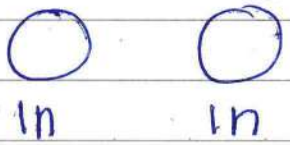
[3] Anaphase I ⇒ Separate each duplicated chromosomes from its homologue and move toward poles
(sister chromatids remain but homologous chromosomes separate)

[4] telophase I ⇒
chromosomes gather into nuclei at the poles
(one long and one short chromosome at each pole, representing a homologue from one each pair).

* The nuclei now form, followed by cytokinesis



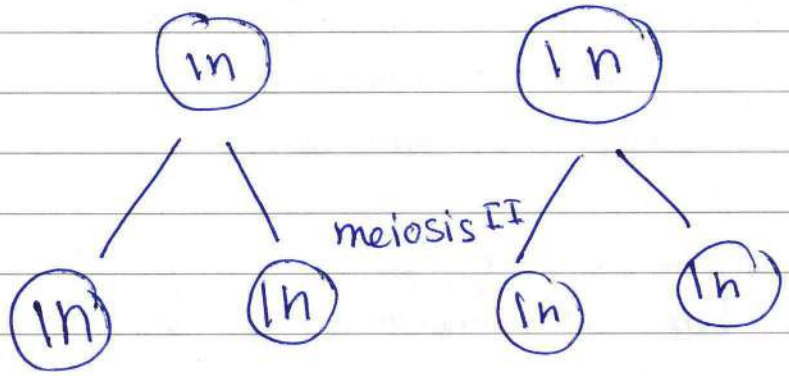
* At the end of meiosis I, we have 2 daughter cells



DNA _ لجنة

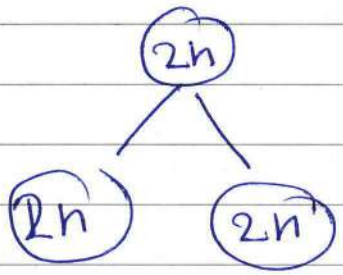
* meiosis II *

meiosis II are similar to mitosis, but meiosis II occur in reproductive cells to give 4 daughter cells haploid (1n)

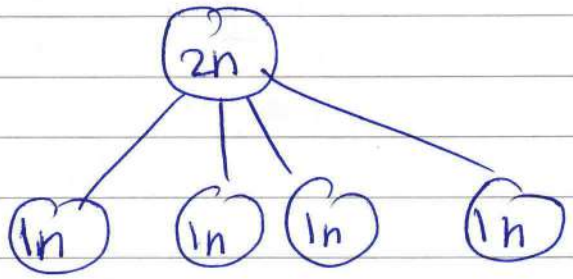


In general :-

mitosis



meiosis



DNA Day #لجنة_

Lab(15):-

plant diversity 1:- Non vascular plants (Brygophytes) and Seedless vascular plants

الطحلبيات

* The evidence from comparisons of extant (موجود) Land plants and phyla of algae suggests that the first land plants shared a common ancestor (سلف) with green algae, particularly the charophytes

* these first colonist are thought to be most similar to the living, brached, multicellular greenagla Chara.

* only individuals that were able to survive the variations in temperature, moisture (الرطوبة), gravitational force (قوة الجاذبية) and substrate (الركيزة) would thriv

* the lands plants:⇒ new and different adaptations (تكيف) and new different life.

* plant tree ⇒ KingDom: plantae

- Non vascular plants [Brygophytes]
  - phylum Bryophyta → [Mosses]
  - phylum hepatophyta → [liverworts]
  - phylum Anthocerophyta → [Horn warts]
- Vascular plants
  - Seedles plants
    - phylum lycophyta → club mosses
    - phylum pterophyta → ferns
  - Seed plants
    - Angiosperms → phylum Anthophyta → flowring plant
    - Gymnosperms
      - phylum coniferophyta → conifers
      - phylum cycadophyta → cycads
      - phylum Ginkgophyta → Ginkgo
      - phylum Gentophyta → mormon tea

Day / /

#لجنة_DNA

* land plants have complex, multicellular plants bodies that are specialized for avariety of.
Function ⇒ for example it produce embryos and have envolved specialized structures for protection of the vulnerable stages of sexual reproduction
- لها تراكيب متخصصة توفر الحماية لأجل التكاثر الجنسي .

* land plants in the Kingdom ⟶ plantae

* plant body covered with (waxy cuticle) :-
1. it prevents gas exchange by (stomata)
2. it prevents desiccation (drying) الجفاف

* What is the importance of vascular tissue? الخشب واللحاء
for efficient movement of material through plants يسمح بنقل فعال

* you have to know that reproductive cyHe and structures of plant adapted to the land environment.

* what is (Alternation of generation)?? تعاقب الأجيال
it is a common sexual reproductive life cycle in all land plants

⇒ In this cycle a diploid sporophyte (2n) alternates with تبادل
a haploid gametophyte (1n).

* In living land plants 2 generation differ in their morphology but they are the same species.
- يختلفان في تشكلهما ولكن ينتميان نفس الأنواع

Day / /

DNA _ #لجنة

* Non vascular ⟶ the dominant stage is Gametophyte (1n)
* Vascular ⟶ the dominant stage is sporophyte (2n)

* haploid spores are produced on the sporophyte by meiosis
* haploid gametes are produced in the gametophyte by mitosis

* Focous on Fingre 15.2 page 392

* The gametes (egg and sperm) fuse by process [Fertilization] it occurs by entrance of sperm into the archegonium forming zygot (2n)

Gametes	Spores
- haploid (1n)	- haploid (1n)
- produced by mitosis	- produced by meiosis
- gamete + gamete = zygote(2n) 1n + 1n	- haploid spores germinate formes anew haploid gametophyte plant

Non vascular plant (Bryophytes) ⟶ Example (Mosses) الطحالب

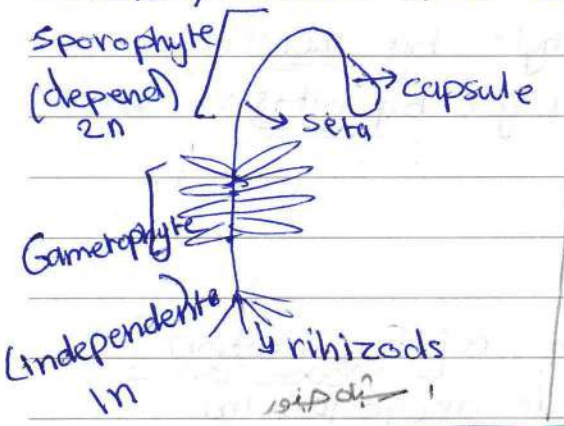
① Small size
② lack vascular tissue وذلك لأنها تفتقر للأوعية الناقلة
③ moist habitant
④ ancient plant
⑤ important for other groups of plants
⑥ the dominant stage is gametophyte

* Gametophyte plants remain close to the ground ⟶ so sperm can swim from the autheridium to the archegonium to fertilize the egg

Day / /

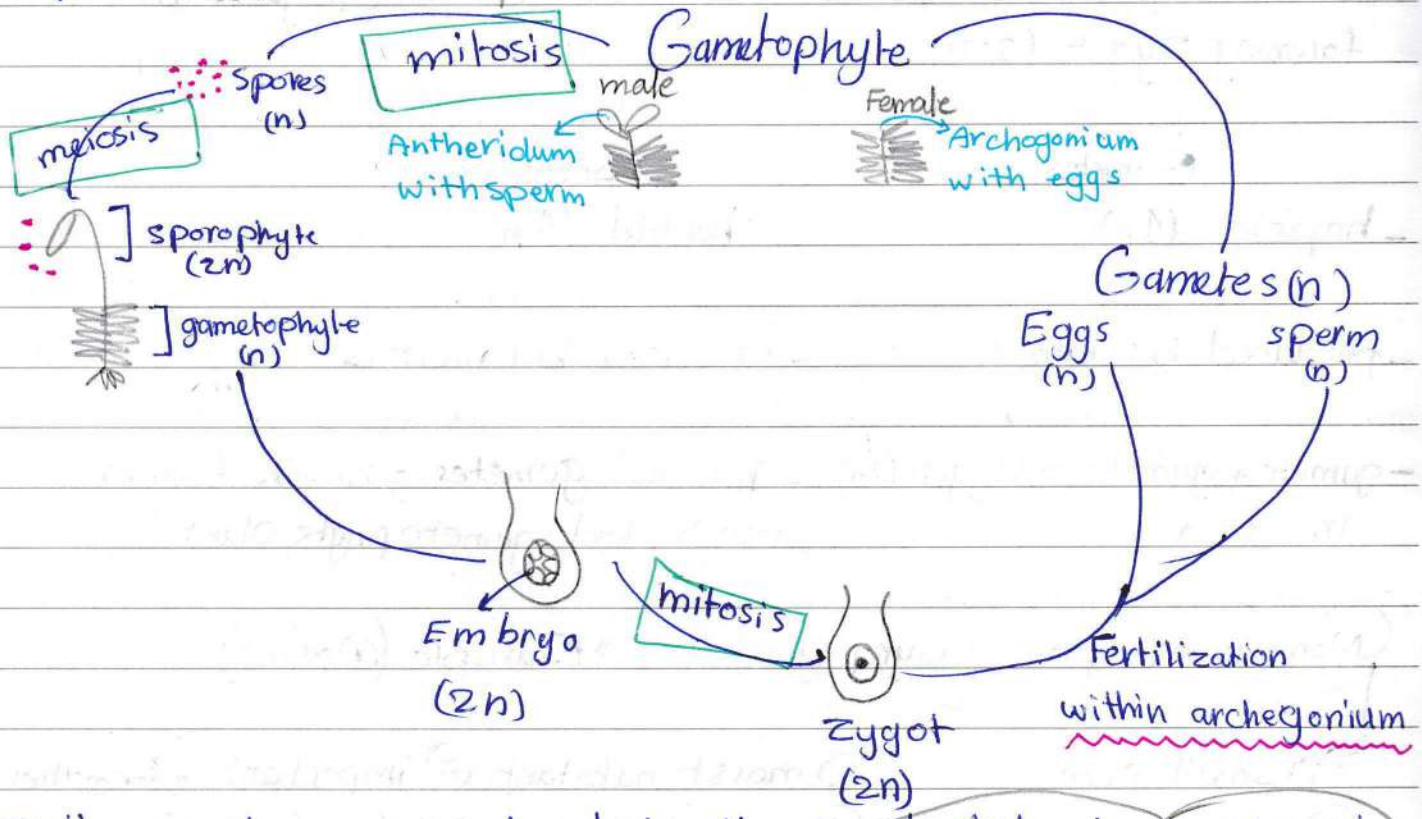
DNA_ لجنة

* gametophyte plants have a cuticle but lack stomata on the surface of gametophyte thallus (plant body) which is not organized into roots, stems and leaves.

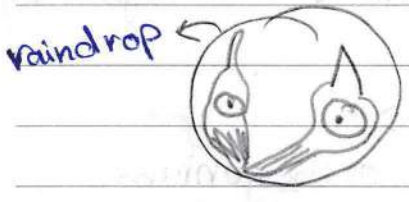


* Sporophyte depends on gametophyte ⇒ that means sporophyte develops and matures while attached to the gametophyte and receives its moisture and nutrients.

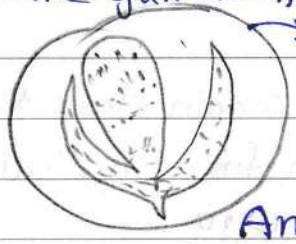
* focus on figure 15.4 page 396



* the gametes are produced by the gametophyte in gametangia (protect the gametes) by mitosis



Archegonia has a very long neck and rounded base



Antheridia

* Sporangium = Capsule

Day / /

DNA _ لجنة

* Seedles vascular plants *

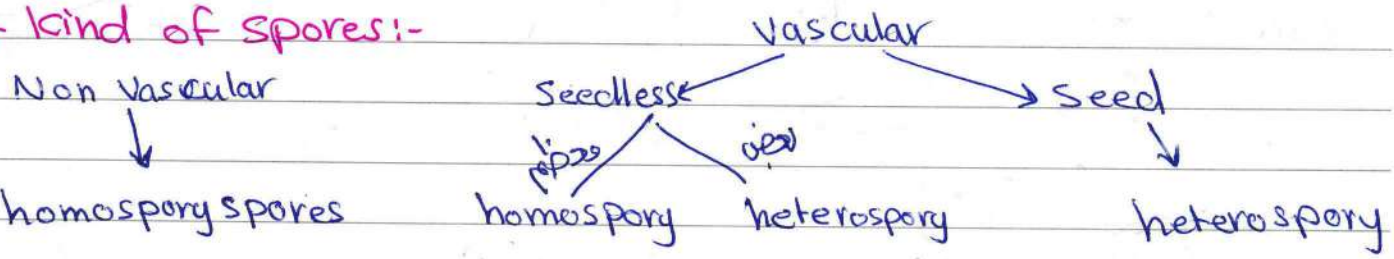
① dependence on water for external fertilization and development of the unprotected, free-living embryo
② lives in swampy areas مستنقعات
③ All Seedless vascular plants have vascular tissue which is speciallized for
- conducting water
- conducting nutrients
- conducting photosynthetic products

④ Sporophyte is the dominant plant
⑤ have well-developed leaves and roots, stomata and structural (support tissue)
⑥ Sperm require water for fertilization
⑦ gametophyte is small and restricted to moist habitants.

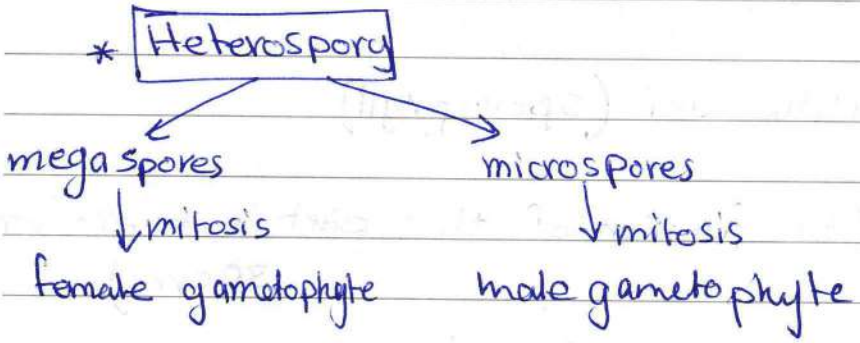
A lycophyta (club mosses)

* Nonvascular plants and most seedless vascular plants produced one type of spore (homospory) → which gives rise to the gametophyte by mitosis.

* kind of spores:-



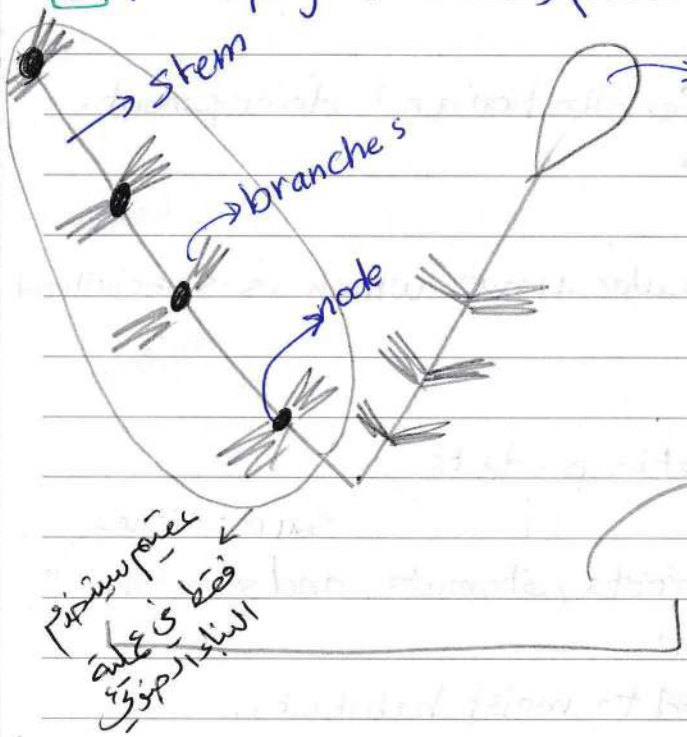
* Heterospory



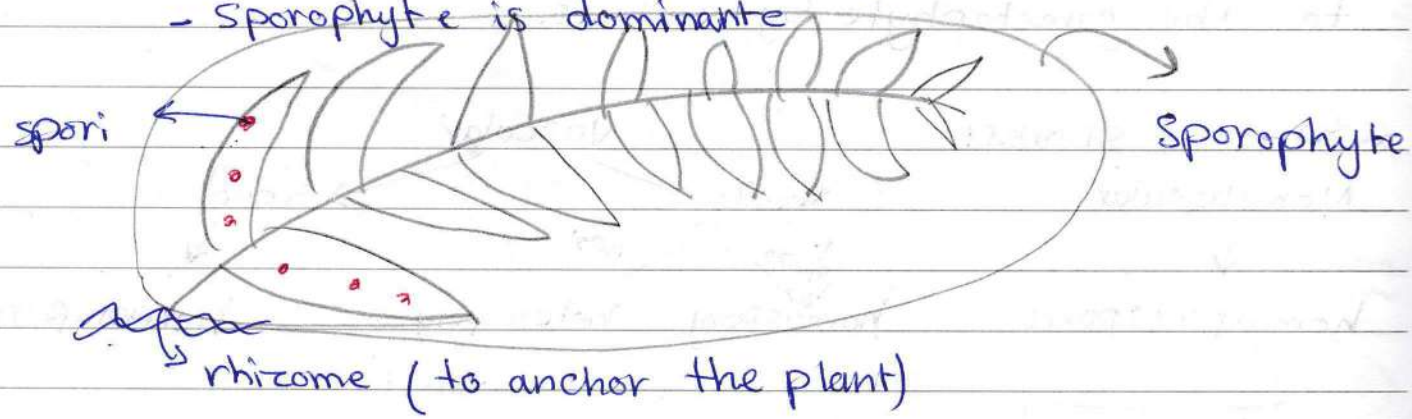
Day / /

DNA _ لجنة

B. Pterophyta : Fers, (Horse tails), whisk ferns



*Ferns :- (the most successful group of seedless vascular plants)
- (live in tropical rainforests)
- (Small plants that lack woody tissue)
- Sporophyte is dominante



* the sporopyte leaf with sori (sporophyll)

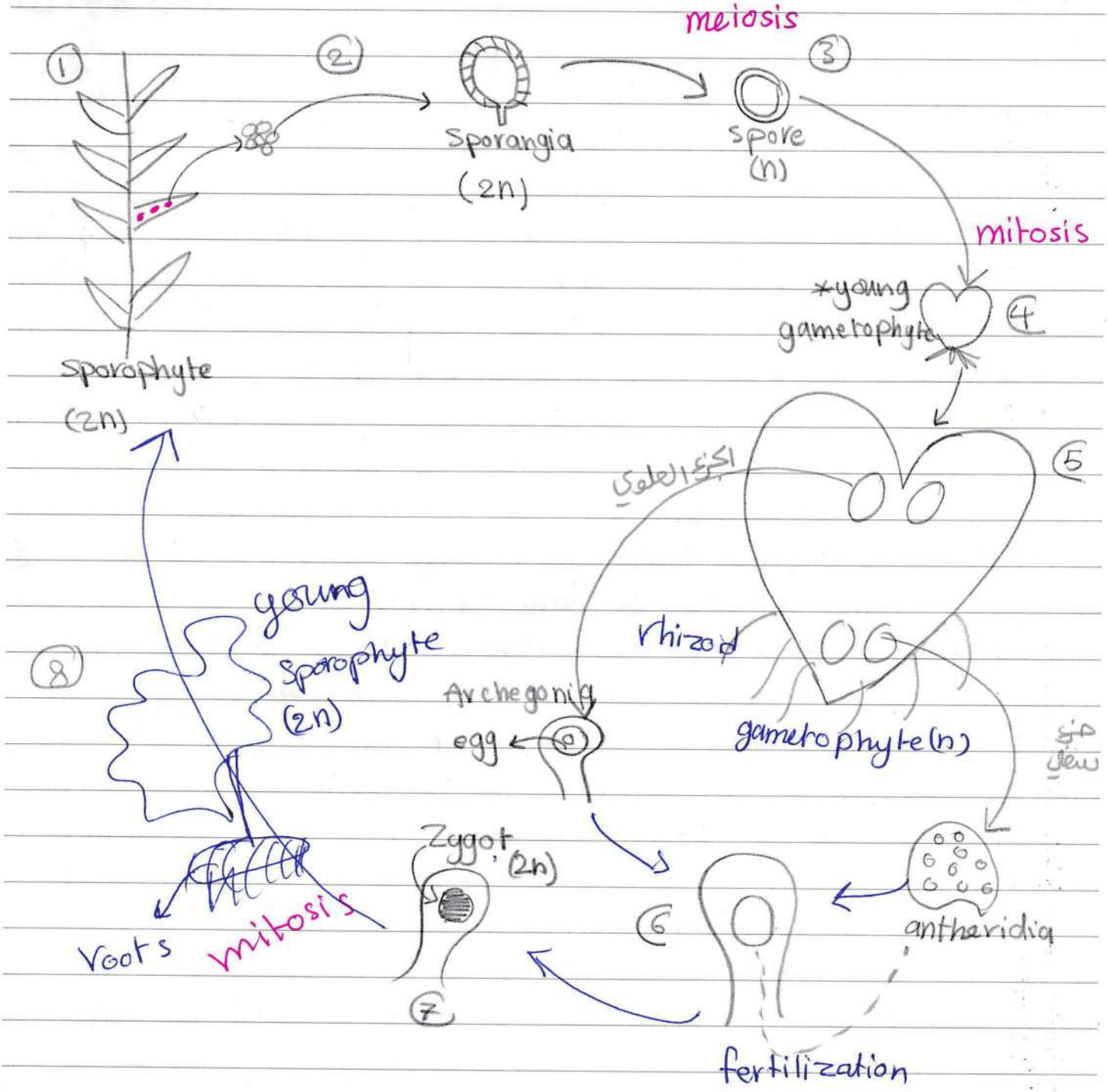
* Sori have sporangia (the function of this part is to produce spores)

Sorus

Day / /

#لجنة_DNA

*Ferns life cycle :-



DNA _ #لجنة

Lab(6):- plant Diversity II

* Seed plants :-

① Gymnosperms :- gymnosperms became free from dependence on water through the development of a process of internal fertilization via [pollen grain] and development of (seed) which contains a dormant - embryo with a protective cove and special nutrient tissue.

* several features of the gymnosperms have been responsible for their success :-

[a] they have reduced (smaller-sized) gametophytes (the male gametophytes is a multinucleated pollen grain) (the female gametophytes is small and retained within the sporangium in the ovule of the sporophyte generation)

[b] pollen grain is (desiccation resistant) and adapt for wind pollination (All gymnosperms are wind pollinated)

[c] The pollen tube conveys the sperm nucleus to an egg cell

[d] The embryonic sporophyte develops within the gametophyte tissue which are protected by the previous sporophyte generation

[e] gymnosperms have advanced vascular tissues

- Xylem: For transporting water and nutrients
- phloem: For transporting photothanic product

* The xylem cells are called (tracheids) and are more efficient for transport than these of the seedless vascular plants

** The term gymnosperms refers to a diverse group of seed plants that dont produce flowers (non flowering)

Day / /

DNA_ لجنة

** Although they share many characteristics, including the production of pollen, they represent four groups (phyla)

** Gymnosperms are heterosporous

- male microspores → developed into pollen
- Female mega spores → developed into the female gametophyte

* Female gametophyte retained within the mega sporangium and nourished (تتغذى) by the sporophyte parent plant

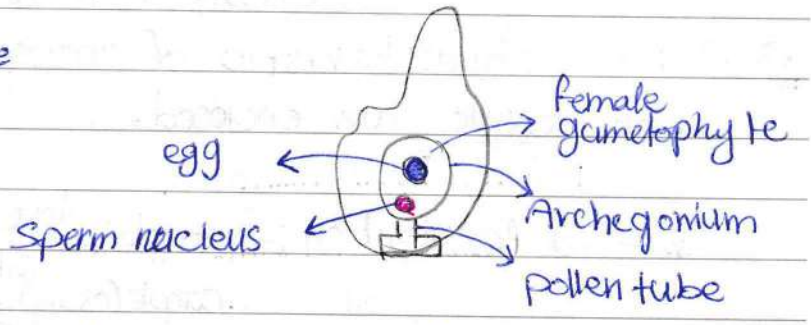
* Female gametophyte develops archegonia, each containing an egg

⇓ توضيح أكثر

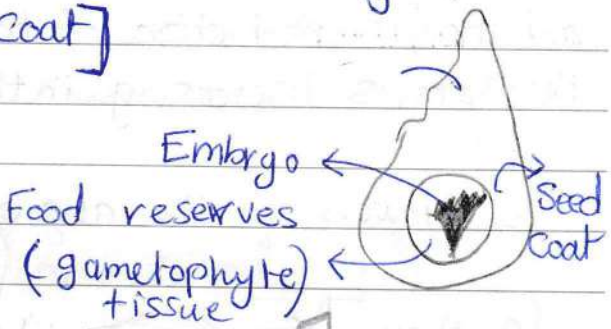
** Gemnosperms are heterosporess

- Male Microspores → developed into pollen (male gametophyte)
  - produced in each microsporangium
  - become mature (تنضج)
  - released into the air and conveyed (تنقل) by wind currents to the female cone
- Female mega spores → developed Female gametophyte
  - retained within the mega sporangium
  - develops archegonia
  - each one contains An egg

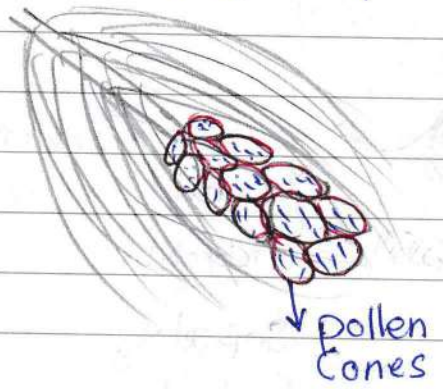
* pollen tubes grow through the tissue of the mega sporangium and the sperm nucleus is releazed to fertilize the egg



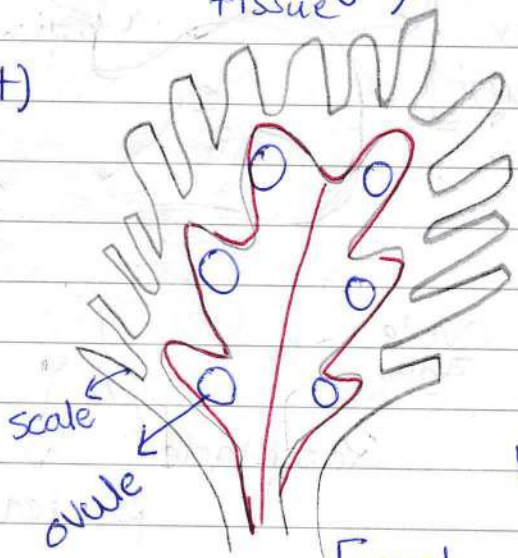
* After fertilization, development results in the formation of an embryo. A seed is aderment embryo embedded in nutrient tissue of the femal gametophyte and surrounded by the hardened sporangium wall [seed coat]



* Pine ⇒ (GymnoSperm plant)



Male gametophyte



Female gametophyte

Day / /

DNA _ لجنة

② Angiosperms → ① flowring plants
② classified in the phylum (Anthuphyta)

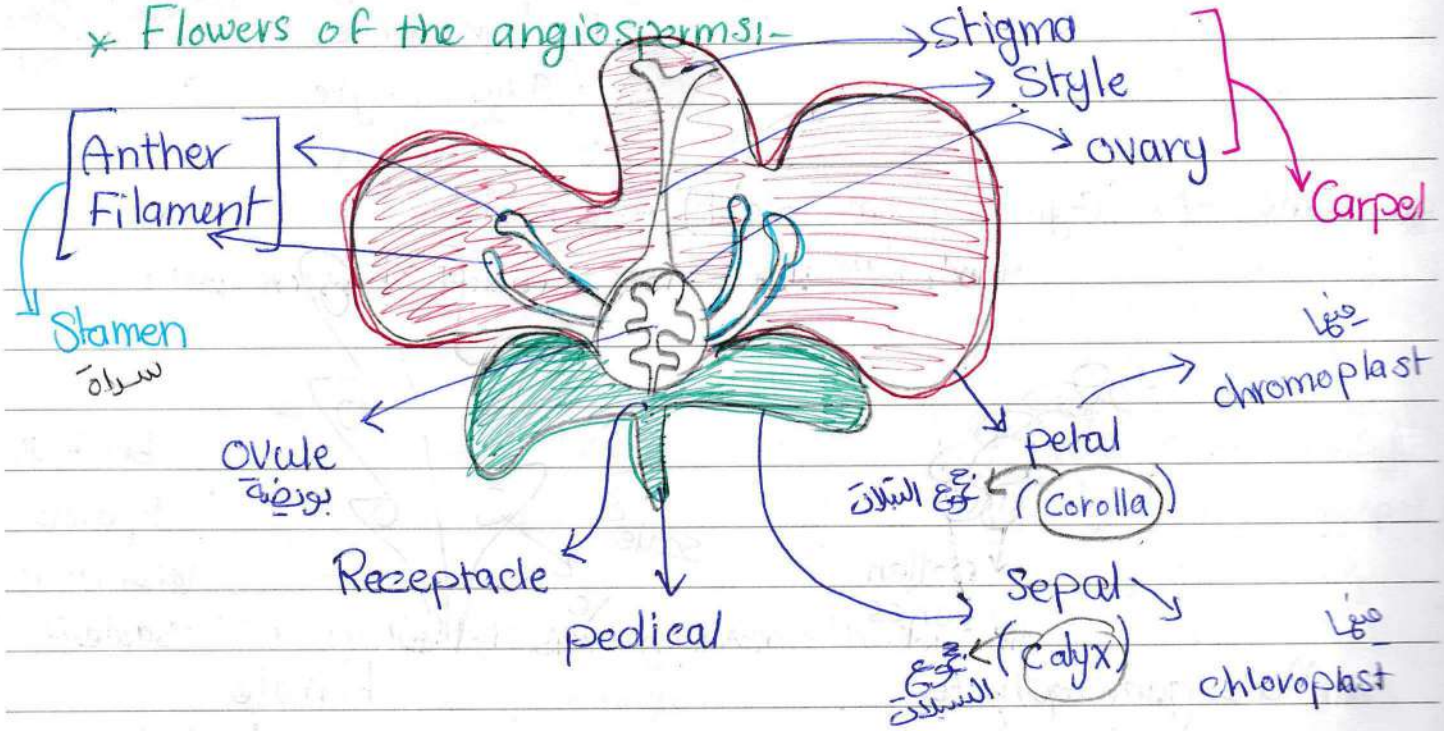
③ A unique characteristic of angiosperms in the Carpel astrue in which ovule are enclosed.

* After fertilization :- ovule → develops into → Seed
carpel (ovary) → develops into → fruit

* fruite provides protection for Seeds

④ other important aspects of angiosperms reproduction include additional reduction of the gametophyte (double fertilization) So there is increasing in the repidity of the reproduction processer

* Flowers of the angiosperms :-



* petal + Sepal ⇒ perianth

Day / /

DNA_لجنة

* Seed and fruit may be involved in dispersal of the Sporophyte embryo

*perianth : The attractive or protective leaf like structure that is surrounded male and femal reproductive structure

* Flower Functions ⇒ ① to protect the developing gametes
② be ensure pollination of fertilization
* Angiosperm → many of them are self-fertile
→ cross-fertilization (important in maintaining genetic diversity)

* The pollen germinates (تنبت) into apollen tube and grows through the female carpel to deliver (تُوصل) the Sperm to the egg.

* what are features that atract pollination? ① colour / ② scent / ③ Shape
وراثية

* Nectar and pollen provide nutritive rewards for the pollinators as well
تحصل الملقحات على مكافأة مقابل عملية التلقيح

* The Shape of Some of the flowers are structured to accommodate pollinators of Specific Size of structure.
[while theflower is encourging the visitation byone type of pollinators, it excludes visitation by others]
تشكل الزهرة مصمم لأنواع معين من الملقحات وأشكال معينة

* Some plants dont have colorfals, showy flowers (dull in color) and lacking aperianth. Theseplants dipinds on wind-pollinated, produced enormous qaantites of polken and adapeted to catch pollen in the wind.

Day / /

DNA_لجنة

* Focus on [Floral plants] page (425+426)

* Remark ⇒ ① Stamen (Anther) function is ⇒ producing male gametes (pollen grain)

② Receptacle ⇒ is a reproductive part

* Most showy flowers are pollinated by animals
* The common pollinators (bees, flies, butterflies, hummingbird)
طائر الرنان

DNA_لجنة#

lab(20): plant anatomy.

Summary of basic plant tissue systems and cell types:-
1. Dermal tissue system: Epiderms
2. Ground tissue system: parenchyma, collencyma, Sclerenchyma
3. Vascular tissue system: Xylem, phloem
4. Meristematic tissue system: primary meristem, cambium, pericycle

[1] Dermal tissue:- Epidermis → protections

* The epidermis → forms the outermost lyer of cells, usually on cell thick covering the entire plant body

Shape ⇒ flattened and rectangular

epidermal cells include:
1. guard cells of stomata
2. hairs called trichomes
3. unicellular root hair

* Most epidermal cells on aboveground structure are covered by a waxy cuticle → prevents water loss

* Epidermis ⇒ provides protection and regulate movement of materials.

[2] Ground tissue:

→ paranchyma:- the most common cell in plants and characteristically thin-walled with large vacuole.

Functions:-
1. photosynthesis
2. support
3. storage of materials
4. lateral transport

Day / /

DNA _ لجنة

→ collenchyma :- usually found near surface of stem, leaf petioles (أعناق), veins (النوردة). Characterized by thick cell wall
function: provide flexible support to young plant organs

→ Sclerenchyma:- thickened cell wall contain Lignin, most common type of this cells are long thin fibers

function:- ① provide strength and support to mature plant structu
② may be dead at functional maturity

3 Vascular tissue system:- (complex tissue) transport of materials throughout the plant body

→ Xylem :- ① transport of water and minerals throughout the pla
② provides support

* Tracheids ⇒ long, thin cells with perforated (مثقب) tapered (مدبب) ends
* Vessel elements ⇒ larger in diameter, open-ended, and joined end to end, forming continuous system referred to as vessels.

(Tracheids and vessel elements) ⇒ are the primary water-conducting cells.

Xylem → ① Parenchyma cells:- storage and lateral transport
→ ② Fibers :- provide additional support

→ phloem:- this complex tissue composed of living, conducting cells called sieve-tube members.
↳ which lake a nucleus and have sieve plate for end walls

function of phloem ⇒ trasport products of photo synthesis throughout the plant as part of vascular tissue system.
(conduction of nutrient)

Day / / DNA _ رجنة #

* the cells are joined end to end throughout the plant. each sieve-tube member is associated with one or more adjacent companion cells.
  ↳ which are thought to regulate sieve-tube member function

* phloem → ① parenchyma: storage / lateral transport ②
  → ② fibers: provide additional support
  Sclerenchyma ↵

4 Meristematic tissue:
→ primary meristems:- Consist of small, actively dividing undifferentiated cells located in buds of the shoot and in root tips of plants.
function:- produce the primary tissues along the plant axis throughout the life of plant

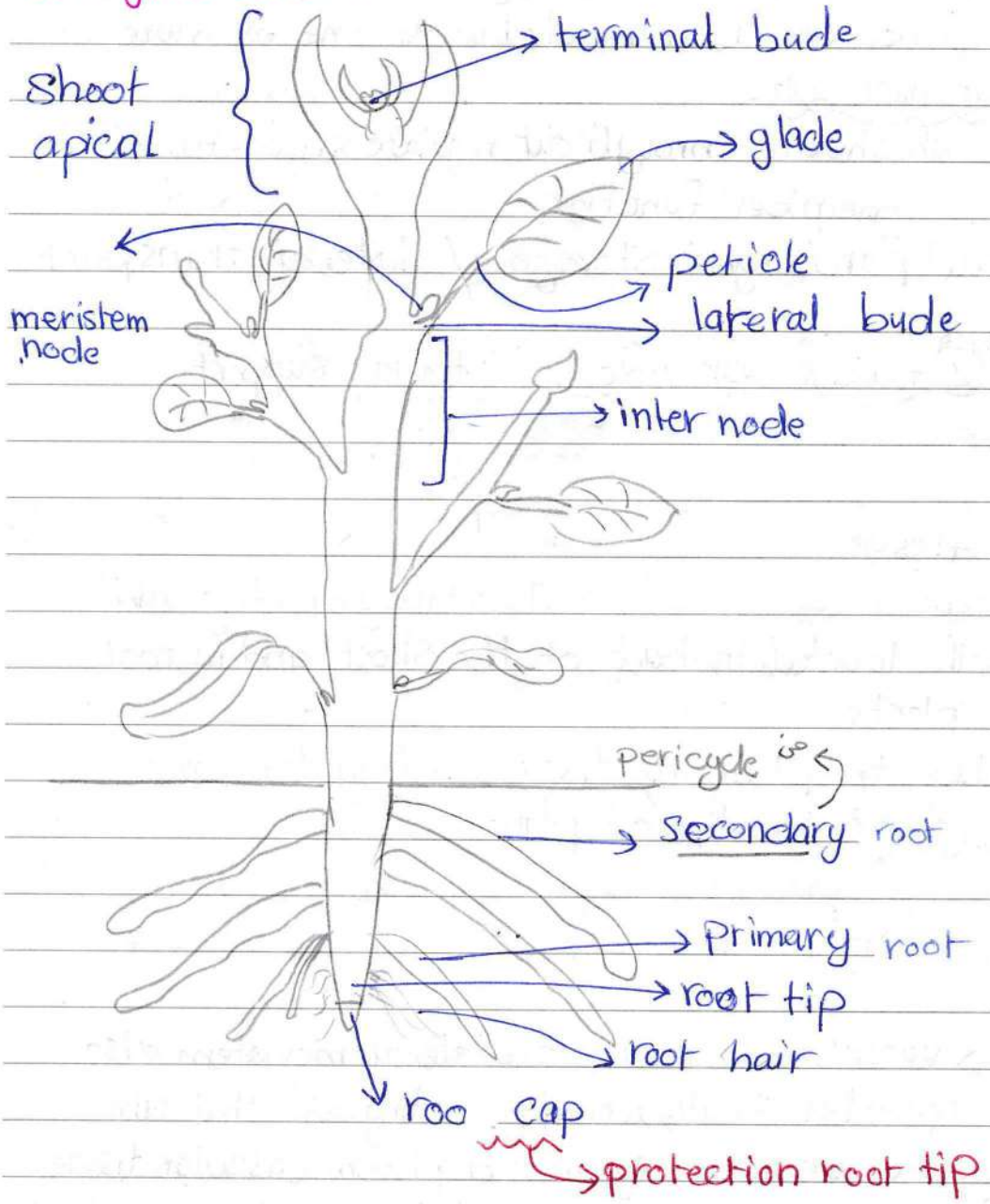
→ pericycle:- محيط

→ Cambium: → vascular cambium:- is a lateral meristem also composed of small, actively dividing cells that are located between xylem and phloem vascular tissue.
function ⇝ these cells divide to produce secondary growth, which an results in an increase in circumference.

→ Cork Cambium:- is a lateral meristem located just inside the cork layer of woody plant.
function ⇝ these plant divide to produce Secondry growth

* page (521) very important.

*Figure 20.2 :-



* plant primary growth and development:-
primary tissues:- tissues produced from apical meristems, and this growth is called primary growth.

*primary growth occur along the plant axis at the shoot and the root tip.

Day / /

DNA_ لجنة

* certain meristem cells divide in such away that one cell product becomes anew body cell and the other remains in the meristem.
* beyound the zone of active cell division, new cells become enlarged and specialized (differentiated) for specific functions.

* Cell Structure of primary tissues :- → dicot stem

- All herbaceous (non woody) flowering plants produce a complete plant body composed of primary tissue, derived from apical primary meristem.

- This plant body consists organs - roots, stems, leave, flowers fruits, and seeds.
and tissue systems - dermal, ground and vascular.

* Stem :- is usually the main stalk, or axis, of a plant and is the only organ that produces buds and leaves.

* Stem function : ① Support leaves
② Conduct water and inorganic substances from the root to the leaves and carbohydrate products of photosynthesis from the leaves to the roots
③ Most herbaceous stems stems are able to photosynthesis

* Stems exhibit several interesting adaptation :-
① water storage in cacti
② carbohydrate storage in some food plants
③ thorns that reduce herbivory in a variety of plants

Day / /

DNA - لجنة

* phloem tissue is composed of three cell types:-

a- Dead, fibrous, thick-walled sclerenchyma cells that provide support for the phloem tissue and appear in a cluster as a bundle cap

b- Sieve-tube members which are large, living, elongated cells that lack a nucleus at maturity. they become vertically aligned to form sieve tubes, and their cytoplasm is interconnected through sieve plates located at the ends of the cells. sieve plates are not usually seen in cross section.

c- Companion cells, which are small, nucleated parenchyma cells connected to sieve-tube cells by means of cytoplasmic strand

* Xylem tissue is made up of two cell types:-

A Tracheids, which are elongated, thick-walled cells with closed tapered ends. They are dead at functional maturity, and their lumens are interconnected through pits in the cell walls

B Vessel elements, which are cylindrical cells that are large in diameter and dead at functional maturity. They become joined end to end lose their end walls, and form long vertical vessels.

* vascular cambium :- is a type of tissue that is located between the xylem and phloem and which actively divides to give rise to secondary tissues.

* page (531) very important.

Day / / DNA_ لجنة #

Roots :-

- Comparison with roots and stem

Roots	Stem
- grow in the soil	- above the ground
- Some roots (adventitious roots) grow above ground	- Some ~~stems~~ (rhizomes) grow underground

① when a seed germinates, it sends down a primary root, or radicle, into the soil. This root sends out side branches called lateral roots, and these in turn branch out until a root system is formed

* if the primary root continues to be largest and most important part of the root system, the plant is said to have a taproot system.

* if many main root are formed, the plant has (fibrous root system)

* Most grasses have a fibrous root system, as do trees with roots occuring within 1 m of soil surface
- Carrots, dandelions, pine trees ⇒ example of plants having taproots.

② - Note that the root lacks a central pith.
- The vascular tissue is located in the center of the root and is called the vascular cylinder.

The cortex - is primarily composed of large parenchyma cells filled with numerous purple-stained organelles

③ *The endodermal: is the inner most cell layer of the cortex

*The walls of endodermal cells have a band called the Casparian strip- made of suberin, a waxy material- that extends completely around each cell.

*This strips forms a barrier to the passage of any thing moving between adjacent cells of the endodermis.

* All water and dissolved materials absorbed by the epiderm root hairs and the transported inword through the cortex must first pass through the living cytoplasm of endodermal cells before entering the vascular tissues.

*The pericycle:- is alayer of dividing cells immediately inside the endodermis, it gives rise to lateral roots.

④ Roots have primary 4 functions:-

1- anchorage of the plant in the soil

2- absorption of water and minerals from the soil

3- Conduction of water and minerals from the region of absorption to the base of the stem

4- Stareh storage to varying degrees, depending on the pla

Day / /

DNA - لجنة

Leaves :-

- are organs especially adapted for photosythesis

* The thin blade portion → ① provides a very large surface area for the absorption of light
② provides the uptake of carbon dioxide throug stomata.

* The leaf is basically a layer of parenchyma cells (The mesophyll) between two layers of epidermis

* The loose arrangement of parenchyma cells within the leaf allows for an extensive surface area for the rapid exchange the gas

* Specialized epidermal cells called (guard cells) surround the stomatal opening and allow carbon di oxide uptake Oxygen release, as well as evaporation of water at the leaf surface

* guard cells → photosynthetic

* Cell structure of tissue produced by (secondary growth.)

* Secondary growth arises from meristematic tissue called Cambium.
* The vascular cambium ⇒ a single layer of meristematic cells located between the secondary phloem and secondary xyl

* Dividing cambium cells produce anew cell at one time toward the xylem, at another time toward the phloem.
* each cambial cell produces files of cells, one toward the inside of the stem, another toward out side, resulting in an increase in stem circumference.

* The secondary phloem cells become differentiated into sclerenchyma fibers cells, sieve-tube members, and Cambium cells.

* The secondary xylem cells become differentiated into tracheids and vessel elements.

* Certain cambial cells produce parenchyma ray cells that can extend radially through the xylem and phloem of the

Day / /

DNA _ لجنة

* The Cork Cambium ⇒ is a type of meristematic tissue that divides, producing cork tissue to the out side of the stem and other cells to the inside.

* The cork cambium and the secondary tissue derived from it called periderm.

* The periderm layer replaces the epidermis and cortex in stems and roots with secondary growth.

* These layers are continually broken and sloughed off as the woody plant grows and expands in diameter

[*] Cross section of a woody stem :-

① The outer cork cells of the periderm have thick walls impregnated with a waxy material called Suberin.
dead at maturaty

* the thin layer of nucleated cells that may be visible next to the cork cells is the Cork cambium.

* The periderm includes the layer of cork and associated cork cambium.
* The term (bark) is used to describe the periderm and phloem on the out side of woody plants

② Sclerenchyma fibers ⇒ have thick, dark-stained cell walls and are located in bands in the phloem.

Secondary phloem ⇒ cells with thin cell walls alternate with the rows of fibers

Day / /

DNA _ لجنة

* The vascular cambium ⇒ appears as a thin line of small, actively dividing cells lying between the outer phloem tissue and the extensive secondary xylem.

* The secondary xylem ⇒ Consist of distinctive open cells that extend in layers to the central pith region.

* lines of parechyma cells one or two cells thick from lateral rays that radiate from the pith through the xylem and expand to a wedge shape in phloem, forming a phloem ray

③ Note:- the annual rings of xylem, which make up the wood of the stem surrounding the pith.

Each annual ring of xylem has several rows of :-
→ ① (early wood) ⇒ thin-walled, large diameter cells that grew in the spring.
→ ② (Late wood) ⇒ thick-walled, smaller diameter cells that grew in the summer, when water is less avai

④ Note:- By counting the annual rings of xylem, determine the age of your stem.

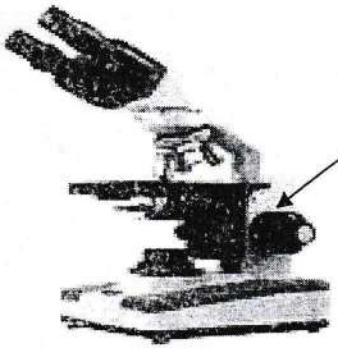
Note:- the phloem region is not involved with determining the age of the tree.

Q1) Label down the parts of microscope shown and right down their function:

Part: Ocular lenses

Function: to see the Samples

Magnifiction 10X



part: Coarse adjustment knob

Function: make the view of the sample more clear.

Focax

Q2) Fill in the Blank:

1- The **maximum total magnification** power of stereoscopic microscope is ..40.. while in compound microscope is ..1000..

2- The source of illumination in compound microscopes is ..light source (lamp).. (under the stage)

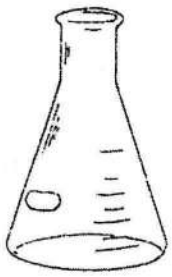
3- The image of sample under stereoscopic microscope is 3-Dimentional and inverted (T / F)

Q3) Compare between stereoscopic AND compound microscopes :

	stereoscopic microscope	compound microscope
specimen	3D	2D
Total magnification	(7-30)	40 – 1000

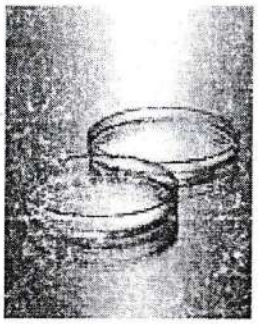
Q4) Label down these laboratory basic tools and instruments:

DNA لجنة #



Beaker

Flask

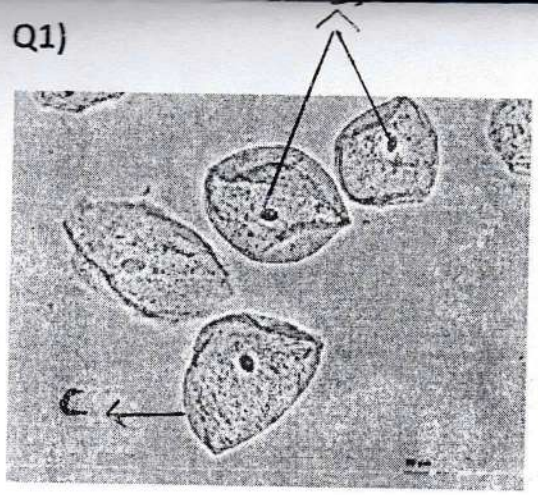


petri Dish

forceps

=

Q1)



a. This picture is for
.....Cheek Epithelial Cells.....

b. The organelle pointed at **b** is
.....Nucleus.....

c. The part pointed at **c** is
.....Cell membrane.

2) Mention 2 differences between:

Prokaryotic cells	Eukaryotic cells
Not have a nucleus	have a nucleus
Not have organelles	have organelles

DNA - الجينة #

3) Complete the sentences:

1. .....methanic Blue..... dye is used to stain the Onion Epidermal cell slide. (methyleline)
2. (The entire plant cell except the cell wall) is called .....protoplasm.....
3. Pseudo pods in *Amoeba* are used to .....defense..... and.....locomotion (to m
4. *Volvox* is an example of a multicellular organism (T/F) .....T.....
5. *Amoeba* is a heterotrophic organism (T/F).....T.....
6. The reproductive cells in *Volvox* are called .....Daughter cells

Q1) Fill In the Blank:

1- The best Temperature condition for the amylase enzyme to give the highest activity was .....37°..... °C (write the temperature)

2- When inhibitor compete substrate to occupy the active site, it is called ..... inhibitor.

competitive

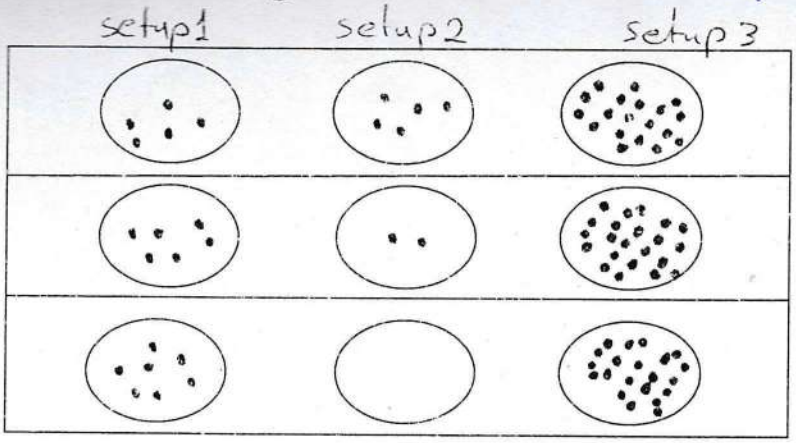
3- The specific best PH for ANY enzyme to catalyze the reaction is called the ~~Optimal~~ optimum PH.

4- Irreversible Destruction of the 3D folding of the enzyme due to extreme condition is called .....Denatures.....

5- Enzymes increase the rate of reaction by .....decrease.....the activation energy

6- Amylase enzyme is found in humans in the ..... Saliva اللعاب

Q2) answer the following:



DNA - لجنة #

1. The amylase is denatures at setup number .....3.....
2. The optimum temperature is seen in setup number .....2.....
3. In our lab experement the 80 ºC result was shown in set up number .....3.....
4. The OPTIMUM PH of amylase enzyme is .....7.....

م. بلسم رزق

Good Luck –F3

1. In a typical plant, all of the following factors are necessary for photosynthesis except

a) chlorophyll b) light c) oxygen d) carbon dioxide e) water

2. In order to help a plant grow glucose is converted into

a) Proteins and cellulose b) starch and sucrose c) chlorophyll d) water and CO2 e) Lipids (fats)

3. Which technique removes the chlorophyll from a leaf?

a) Boiling in water for 5 minutes b) Dipping in hot water c) Boiling in alcohol (ethanol) d) Adding iodine e) Leaving the plant in the dark for 48 hours

4. In order to demonstrate that a plant has been photosynthesizing, which chemical is tested for within the leaf?

a) Glucose b) Starch c) Carbon dioxide d) Iodine e) Starch

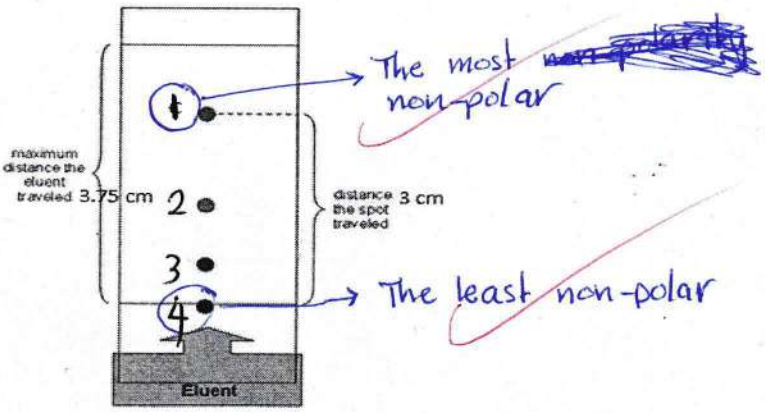
DNA لجنة #

Q2) Fill in the Blank:

1- In light photosynthesis ..Solar..... energy is converted to ..light..... energy which stored as .....

2- We extract the pigments in our lab. TLC experiment from Thin Layer chromatography (name the source)

Q3) In the TLC experiment shown rank (رتب) the spots from the least nonpolar to most:



بلسم رزق

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DNA لجنة_ #

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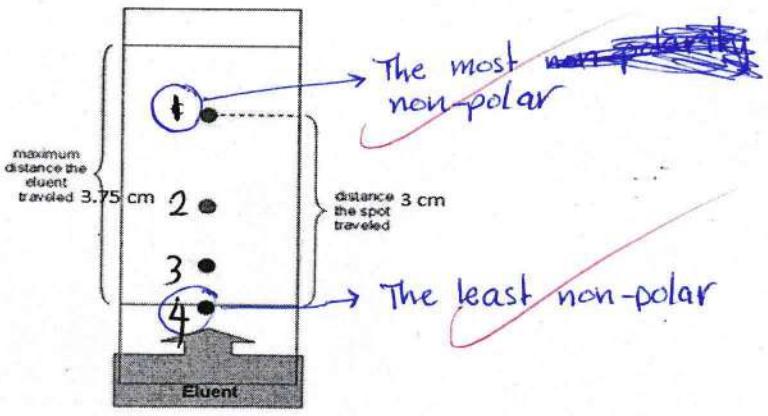


بلسم رزق

Q1) Choose the best answer:

1-Interphase is broken into phases known as :

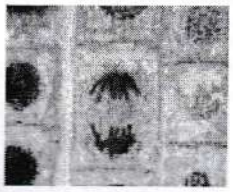
1- G_1, S and G_2 2- S, Mitosis, and Cytokinesis

3- prophase, metaphase, anaphase and telophase 4- G_0, G_1, and G_2

2- What stage of mitosis is shown in the image?

1. prophase 2. cytokinesis 3. telophase

4. anaphase 5. metaphase



3- The phase of mitosis shown is:

1-anaphase 2-prophase

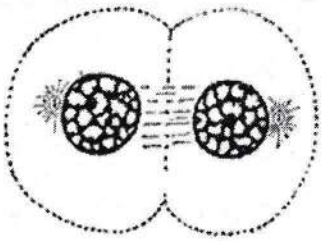
3-metaphase 4- telophase

DNA _ لجنة #

4- What stage of mitosis is shown in the image?

1-telophase 2-prophase

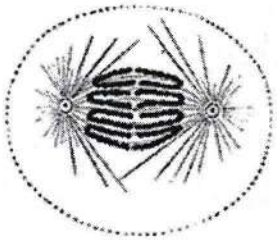
3-cytokinesis 4-anaphase



5- This stage shown in what stage of cell division (please be very specific)?

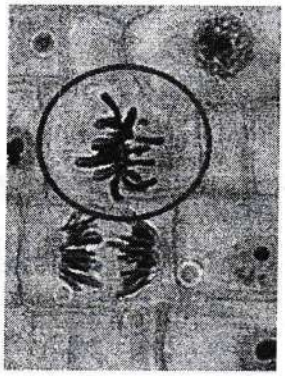
Cell division.....meiosis 1

Stage .....anaphase 1



F1 - Balsam Rizeq

6. The phase of mitosis shown in the circled region above is



1. prophase
2. metaphase
3. anaphase
4. telophase
5. cytokinesis

7. Human cell ordinarily will have a total of 46 chromosomes. At the end of mitosis, the new cells will have:

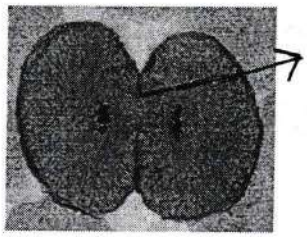
1. 23 pairs of chromosomes; 46 total
2. only the 23 paternal chromosomes
3. 92 chromosomes, as a result of doubling during the S-phase of the cell cycle
4. only the 23 maternal chromosomes

8- The correct order for the stages of mitosis is:

1. prophase, anaphase, metaphase, telophase
2. anaphase, prophase, telophase, metaphase
3. telophase, anaphase, metaphase, prophase
4. prophase, metaphase, anaphase, telophase
5. metaphase, anaphase, telophase, prophase

9. The part pointed at is called:

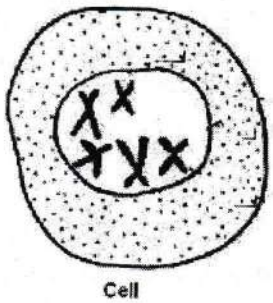
.....Cleavage furrow.....



10. How many chromosomes are shown in the pictures?

..... 5 ..... chromosomes

number of chromosoma = 11



Cell

Q1) Write (T) beside the correct statement and (F) beside the false one :

1. Putting the animal cell in Hypertonic solution causes plasmolysis (F).
2. When the weight difference of the potato tube is positive (+), this means the cells were put in hypertonic solution (F)
3. In the dialysis bag experiment starch molecules move outside the bag. (F)
4. Destruction (Burst) of the Red Blood Cells is called hemolysis (T).

Q2) In this osmosis experiment of a plant cell study the following:

Concentration of solutions	Initial weight	Final weight
0	1.6 g	1.8 g
0.2 M	1.76 g	1.76 g
0.5 M	1.5 g	1.3 g
0.8 M	1.6 g	1.3 g

1. 0.8 M solution is Hypertonic
2. 0 M solution is Hypotonic

DNA #لجنة_

Q1) Write (T) or (F) after reading each statement carefully:

1. Land plants have a complex life cycle that involves an alternation of generations between a haploid gametophyte and a diploid sporophyte (T)

2. The sporophyte of a nonvascular plant is larger and lives longer than the gametophyte.(F)

3. Mosses are generally found in moist habitats.(T)

4. Nonvascular plants have true leaves but lack true stems and roots.(F)

5. Ferns need water to reproduce because their sperms must swim to the eggs.(T)

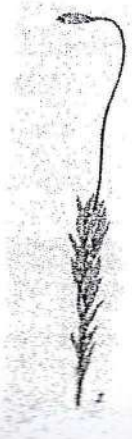
DNA _ لجنة #

Q1) complete the following:

1. The corolla used to attract the insects in to the flower.

2. _____ is the flower attachment to the stalk

2



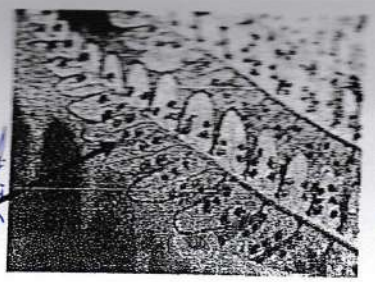
a. Name this plant.... Mosses .....

b. This plant is a vascular seedless plant. True or False?

c. The dominant generation in this plant is (Gametophyte, Sporophyte). Choose

d. This plant belongs to domain (prokaryote, eukaryote). Choose

3



a. Name the structure pointed at ... sporangium

b. Give the function of this structure.. have the spores that is important to reproducti

c. The leaf of this plant is called .. reproductive leaf

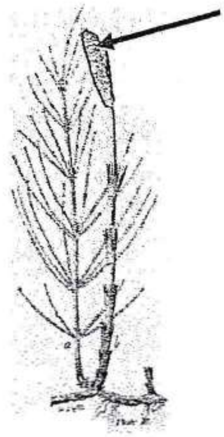
d. This plant is called (fern, moss). Choose

Sporophyll

4 Angiosperms differ from gymnosperms in that angiosperms

A) produce seeds.
B) produce gametophytes
C) contain ovaries.
D) don't contain flowers.

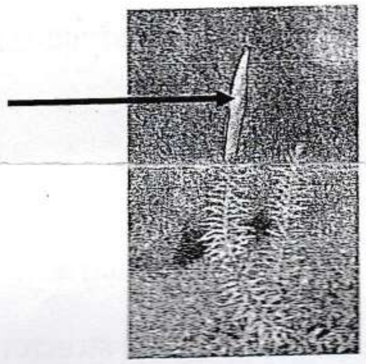
DNA _ لجنة #



a. Give the **common name** of this plant… Horsetail (~~Equisitum~~)

b. Give the function of the structure pointed at… contain the spores "reproduction"

c. This plant belongs to phylum (Lycophyta, Pterophyta) Choose



a. This plant is (Moss, Lycopodium) Choose

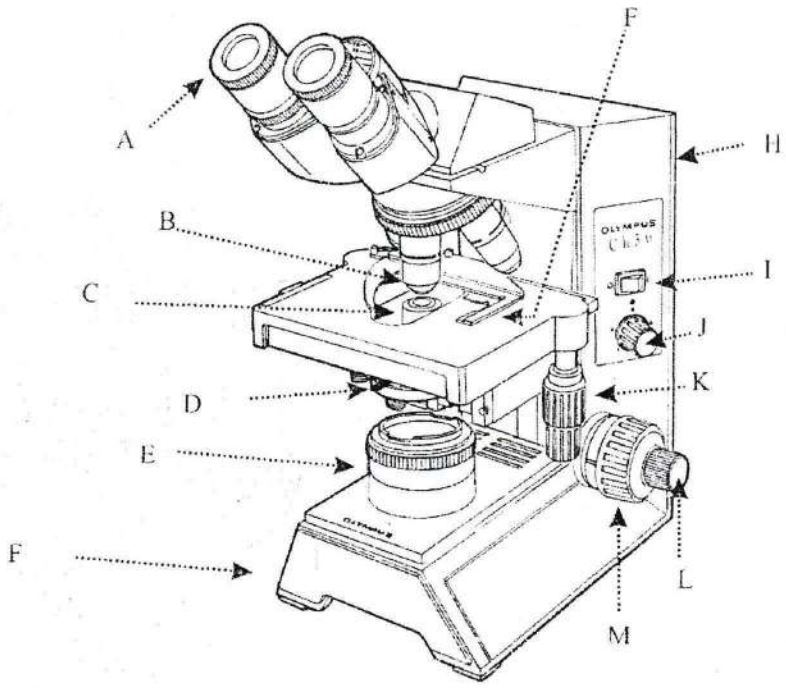
b. Name the structure pointed at….. strobeles….

c. To which kingdom this organism belongs? planta

d. This is a vascular seeding plant. True or False?

Name: Quiz 1 Section:

Q1. Look at the picture below and answer the following questions



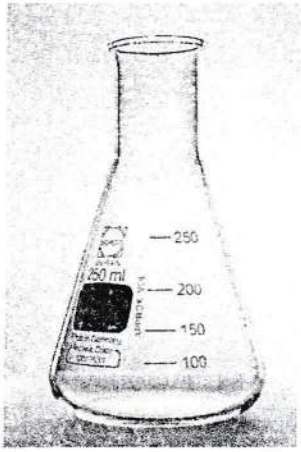
1. This is a .....light (compound, dissecting) microscope.
   (Choose the answer)

2. Name the parts pointed at:
   A. ocular lenses
   F. base

3. Give the function of the part pointed at:
   E. ~~carry all parts of the microscope~~
   Source of illumination

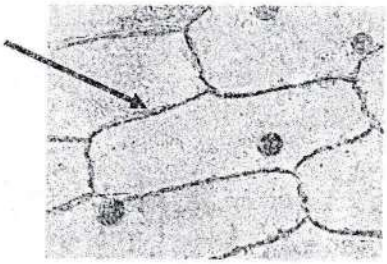
DNA_لجنة #

Q2. Name this glassware

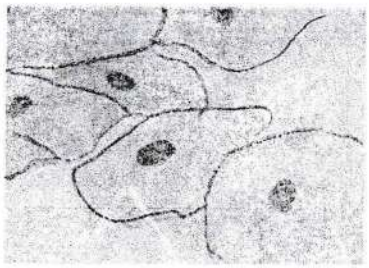


.....flask.....

Q1: Look at the figures below and choose the answer



A

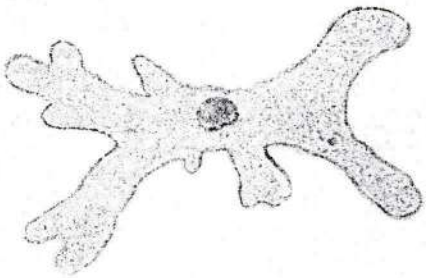


B

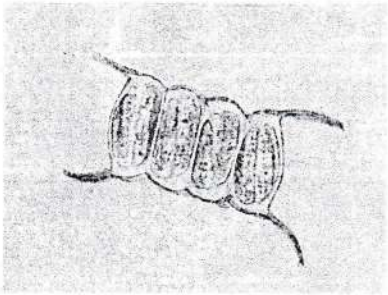
1. The main component in the structure pointed at in figure A is (cellulose, glycogen).
2. Cells in figure B are found in (animal or plant)?
3. The dye used to stain both type of is methylene blue. (True of False?

لجنة_ DNA

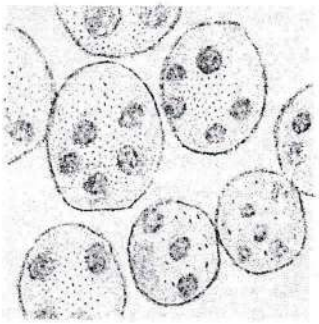
Q2: Look at the figures below and choose the answer:



C



D

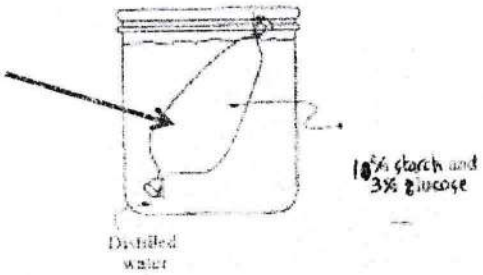


E

1. Which of the figures is a multicellular organism? (C,D,E) Choose the answer
2. Organism C moves by (cilia, flagella, pseudopodia).

(15)

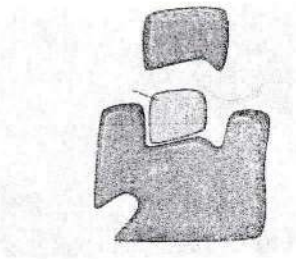
Look at the figure below and choose the answer



DNA _ لجنة #

1. Which solute(s) will move out of the cell, starch or glucose?
2. The physical property studied here is (osmosis, dialysis).
3. The dye used to detect the presence of starch is (Lugol's, Benedict).
4. The dye used to detect the presence of glucose is (Lugol's, Benedict).
5. The separation for this property is according to (size, concentration).

1. This figure represents a (Competitive, non-competitive) inhibitor.



2. Amylase breaks up starch into (glucose, maltose).

3. Amylase works best at pH (6.8, 8.6).

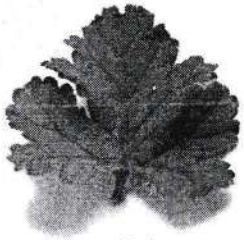
4. Changing the tertiary structure of an enzyme due to very high temperature is called (inactivation, denaturation).

5. The enzyme (increases, decreases) the activation energy of the reaction.

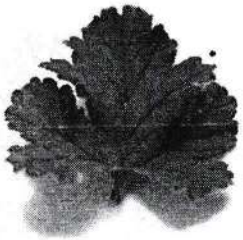
DNA _ لجنة #

$6CO_2 + 6H_2O +$ ...energy... $+$ ...chlorophell ⟶ $C_6H_{12}O_6$ ..... $+ 6O_2$

Q2: According to photosynthesis experiment, each test tube contained a leaf and ethanol solution, boiled till both leaves lost their green color, leaves then were washed and a dye was added to both leaves



Leaf A
Purple black



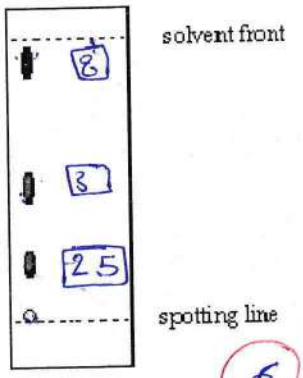
Leaf B
Yellowish brown

DNA #لجنة_

1. The plant used as chlorophyll source is.....B.....
2. Which leaf performed photosynthesis A or B? Choose
3. Name the indicator used to detect the leaf that performed photosynthesis...Iugol's.....

4

Q3: If the distance moved by:
Yellowish green - pigment (1) is 2.5 cm
Blue green - pigment (2) is 3 cm
Yellow - pigment (3) is 8 cm
developing solvent 9 cm



1. Calculate R_f value for chlorophyll a.

$R_f = \frac{\text{distance of pigment spot}}{\text{distance of developing solvent}} = \frac{6}{9} = \frac{1}{3}$ 3 4

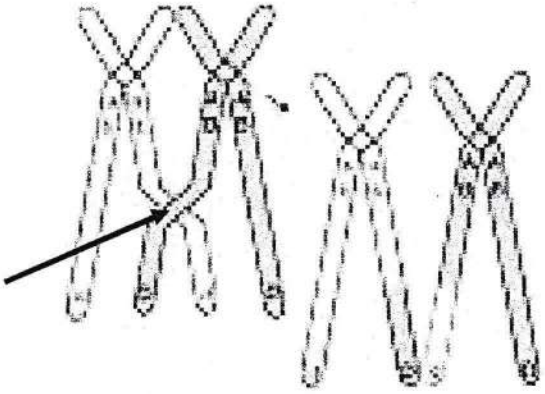
2. Name the technique used in your lab. to separate the photosynthetic pigments.

thin layer chromatography

Q4: Choose the right answer
1. In photosynthesis, light energy is (consumed, produced).
2. The lowest polarity is for (Xanthophyll, Chlorophyll b, Chlorophyll a, Carotene)

Quiz

12



DNA #لجنة_

Look at the above Figure and answer the following

1. The phase appears is (Prophase, prophase 1).

2. If the mother cell has 8 chromosomes, how many chromosomes will appear in the daughter cell by the end of the division?.....4.....

3. The process taking place in this phase is (synapsis, crossing over).

4. Point b is called (chiasmata, centromere).

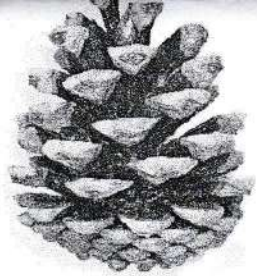
5. These type of cells function in (sexual, asexual) reproduction.

Q1.

1. Name this plant.....pines.....

2. This plant belongs to phylum (anthophyta, coniferophyta). Choose

3. This plant is (Male, Female). Choose



Q2.

1. This plant belongs to phylum (gymnosperms, angiosperms). Choose angiosperms

2. Name structure (a).....~~metal~~.....~~metal~~ 2

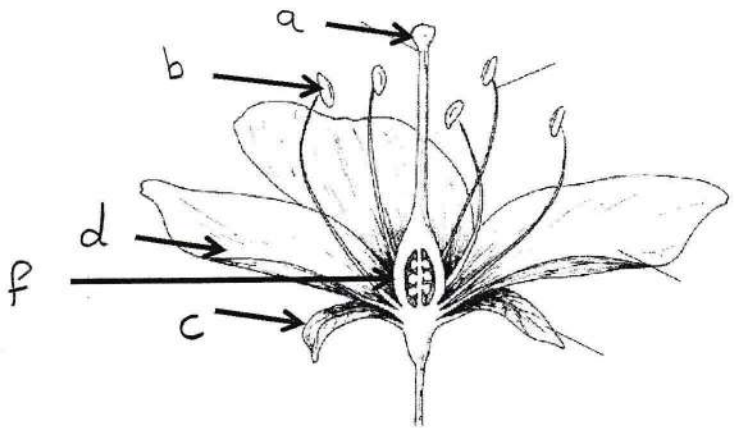
(b).....~~author~~ anther

3. The main type of plastid found in (c) is..chloroplast.....

4. Give one function for (d)...attraction.....

5. The fate of the structure pointed at (f) is (seed, fruit)

5. This plant belongs to kingdom...anthophyta..... 2



DNA #لجنة_