FINAL REVISION FOR 2ND SEC

1) Heterotrophic : herbivores , carnivores(predatory bird) , omnivores .
Parasite (bilharzia + orobanche plant doesn't contain chloroplast) ,
Saprophytes (feed on dead organisms)
2)Diffusion : Solutes move from high to low,(no ATP) vegetables gain salty taste by diffusion
2)Osmosis : water,(high concentrated osmotic pressure such as salty and desert plants absorb water
3)Active transport : low to high (need energy =ATP = Phosphorus = respiration)
4)Imbibition : dry surface of cell wall –cellulose or lignin or pectin absorb water (used in tissue paper)
5)Selective permeability in cell membrane: allow H2O & salts w 7gat la (protein and sugar 3shan large
6)Macro nutrient: Mg (chlorophyll) , Phosphorus (ATP), Iron (co enzymes of dark reaction),
Nitrate ,phosphate, sulphate make protein (enzymes)
7)Micro nutrient : ay 7aga Tanya plant 3wza bs be kmya olyla as activators for enzymes
8)Exchange of similar ions (Na+ instead of K +)

1)Ay mkan feha Chloroplast (Green) hy3ml photosynthesis: (green leaves – green herbaceous stem)
2)Chloroplast transparent not reflective (lw 3leha suberin aw ay mada thick , it will not absorb light)
3)Grana kteer (feha chlorophyll A) to absorb light kter (light reaction) to produce O2, NADPH2 ,ATP
4)Stroma : feha enzymes (iron & sensitive to temperature) make dark reaction ,
Fixation or reduction Co2 to glucose C6H12O6(ADP – NADP)
5)Chlorophyl A : ($C_{55}H_{72}O_5N_4Mg$) , Chlorophyll B , Xanthophyll 20% (lemon) , Carotene 5 % (orange)
5)PGAL (half glucose) is formed if dark reaction not complete (Melvin Calvin Exp)
6)Leaf :: 1)epidermis (barallel shape + no chlorophyll) + cutin. (Cutin absent in Elodea Aquatic plant
2)palisade (more chloroplast-Mg) , 3)spongy (less), aeration , xylem fu2 , phloem t7t
7)Sulphur bacteria : Co2 + H2S produce glucose + sulphur (similar to plant in dark reaction)
8)Mtnsash ay cell feha mitochondria bt3ml respiration 3shan ttl3 ATP
9) fe 6 water evaporate in dark reaction (transpiration by diffusion)
10)Van Neil Said : source of oxygen evolved is water

1)Anabolims = بناء (occurs more in child or body building or obese, food become part of body)
Catabolism تكسير (oxidation of glucose to produce energy = respiration in mitochondria)
2)Enzyme is (biological catalyst) , Specific , decrease activation energy , خلي التفاعل يحصل من غير مجهود
Temperature in body 37, PH 7.4-8 except stomach contain HCL (pepsin enzyme + protein)
3)Substrate الحاجة اللي بيمسك فيها الانزيم و بتكون عكسه inhibitor اللي بيقلل نشاط الانزيم check enzymes !!
4)mtnsash Tryspinogen in pancreas not active !! , bysht8l lma ynzl small intestine by enterokinase
5)Starch is digested firstly in mouth (amylase) , protein = stomach (pepsin),
Lipids (butter) = duodenum by lipase from pancease (bysa3do bile juice from liver – stored in gall bladder) Note L fats are digested and rebuilt in small intestine by engulfment
5) ramset el villi (rich in blood capillaries) + lacteal vessel for fats , vitamin KADE
6)Mucus in mouth , esophagus (help peristalsis) , stomach (protect it from pepsin) , small and large intestine (defecation)
7)Tablets are capsulated to release its contents in small intestine
8)Diarrhea = problem in small intestine 9)Lactase and sucrose produce asymmetric molecules
9)Egg yolk contain fats , while Egg white contain protein
10)Villi in small intestine absorb digested food , convolution in large intestine absorb water & salts to increase blood volume
11)Intestinal juice (Maltase – Sucrase – Lactase) digest disaccharides

1)in lower plant as spirogyra algae (no special transport , xylem, phloem) . by diffusion , active trans
2)Stem (all cells are parenchyma except cambium mwgud fl stem and not leaves) :
Epidermis (cutin). In cactus (desert plant) and not in Elodea (Aquatic plant)
Collenchyma (Chloroplast +cellulose), Parenchyma (aeration)
Starch sheath (+ iodine = dark blue) Pericycle : (support + Elasticity of stem)
Phloem fuuuu2 (food)
Cambium (undifferentiated – meristimatic cell) divide to form secondary xylem & phloem ,
3)Phloem : Sieve tube + Companion cell (contain nucleus can divide, mitochondria glucose +O2 produce ATP so it is Active process , decrease in cold temp or dec Oxygen
4)Xylem : long tubes non living (gowaha lignin for support + imbibitions of water)
5)Theories : a)Root pressure : (Exudation) just 2 atm , Pinus plant has no root pressure
b)Imbibition : lignin byshrb water, but water ascend through cavity
c)Capillary : kol ma tube tkon narrow , water ttl3 a3la (150 cm)
d)Transpiration : leave pull water from root , Cohesion : attraction H2O – H2O to make water column in xylem vessels Adhesion attraction (H2O + wall of xylem lignin)
6)to know the Age of stem by cutting transverse section
7)Root pressure stops when it is equal to water column pressure
8)Aphid insect insert its mouthparts in stem phloem and gets water-sucrose and amino acids

1)Heart Beat (70 /min) . increase after waking up , joy, exercise / decrease in sleeping , sad, Grief
2)Plasma : (90%water , 7%protein, food, antibodies, hormones , enzyme , wastes) 7.4 bicarbonate
3)RBC (Hemoglobin) transfer O2 and Co2 (gas exchange) – Iron – Anemia - 100 million cell/day ,
4)RBC lma tmot bn3ml mnha bile juice fl liver (5 million in male – 4.5 in female)
4)All arteies contain (OxyHemoglobin = pale red) rayh le ay organ (as brain), except pulmonary artery carries deoxygenated to lung - (artery can pulsate while vein, capillaries cant)
5) WBC : (7000 . inc during infection, inflammation , disease), in lymph and blood
6) Platelet (250,000) . blood clot , Wenta healthy (platelets , prothrombin , fibrinogen)
During injury : (thromboplastin , thrombin , fibrin) , Ca , Vit K
(hemophilia = problem in platelets or liver fibrosis)
7)3ks el thrombin , el heparin (convert fibrin to fibrinogen) produced from liver (double edge)
8)Pulmonary Circulation : pulmonary artery rayh lel lung yrmi Co2, w yakhud O2 fl pulmonary vein
9)Systemic Circulation : aorta to all body yrmi O2 w yakhud Co2 fl IVC and SVC then to RA
10)Hepatic circulation : blood mn el intestine (feh glucose 3ali) hyruh hepatic portal vein , to liver (store some glucose and amino acid) then the remain move in hepatic vein , to IVC to Right atrium
11)between Artery (thick muscles – high pressure-elastic) & vein (thin , low pressure near skin ,valve) , feh blood capillaries (narrowest blood vessel one epithelial layer- lowest pressure 10mmg And contain tiny pores for gas exchange
12)Contraction of right side of heart and left , occurs at same time
13)highest conc of glucose and amino acid = hepatic portal vein, lw fats htb2a fl lymph then superior vena cava then RA of heart (First heart chamber contain fats is Right atrium)
First heart chamber receives nicotine with oxygen is left atrium
14) Highest blood pressure in aorta ! Tarteb el heart chambers = LV then RV then RA and LA
15)Systolic = high pressure 120 , Diastolic = low pressure 80
16)Liver produce Heparin (prevent blood clotting) , prothrombin (help in blood clotting) , bile juice (help in digestion without enzymes)
17)Wbc and platelets and plasma help in immunity (RBC doesn't)
18)Liver is gate to food , while spleen is body grave (byakhud RBC after 120 days y3mlha recycling)

Chapter Three :

1)Glycolysis in Cytoplasm produce : 2 ATP , 2 NADH (primary reactant of glycolysis is glucose) , final is 2 purvate (pyurvic acid) , glycolysis occur in aerobic or anaerobic (needs 2 ATP fl awl)
2)During change Glucose into glucose 6 phosphate (energy is consumed)
3)Actual splitting occurs to fructose 1-6 diphosphate into 2 PGAL
2)For 1 glucose , Krebs cycle rotate twice , (for maltose , Krebs cycle rotate 4 times) in mitochondria
3)Krebs cycle produce : 1 ATP , 3 NADH , 1 FADH2 (edrab fe 2)
4)Amino acid and fatty acid enter Krebs cycle in form of acetyl (2c)
4)Electron transport chain : 10 NADH convert to NaD+ and produce 30 ATP (lose electron = oxidatio
2 FADH2 convert to FAD and produce 4 ATP (oxidative phosphorylation)
5)NAD+ convert to NADH (gain 2 electron = reduction)
5)Rkz fe number of carbon !!! Rkz in fl anaerobic by7sl oxidation lel NADH & give electron to pyruvic
6)Co2 bytl3 fl pyurivc acid oxidation and Krebs cycle 7)glucose + 6 O2 (aerobic)
Anaerobic produce 2 Lactic acid in bacteria (C3) 2 Ethyl alcohol in yeast (C2) & 2 carbon dioxide
(zero NADH – 2 ATP)
8)number of removed electron in electron transport =24 by cytochrome

1)In lung , 600 million alveoli (thin – large area – blood capillaries around it)
2)Trachea contain cilia (expels microbes upwards to pharynx -- cartilage to keep trachea open)
2)lung excrete Co2 + H2o vapour (500/2500 cm) ba2e water excrete as liquid in urine –sweat
3)In Chloroplast photosynthesis produce glucose & O2 (anabolism) , that can be used in Mitochondria bnksr glucose (catabolism – Respiration)
4)plant absorb O2 through stomata in leaf or stem or lenticels , or root or phloem
5)Lime water + Co2 = turbid or cloudy (in alcoholic fermentation)
6)Amount of nitrogen inhaled = exhaled 7)lenticels in woody not in herbaceous plants
8)Nose Is better than mouth because it contains hair for filter , mucus for moisten , capillaries to warm the air

1)Layer that allow light to pass in leaf is epidermis (impermeable to water)
2-Skin pimples are treated by high conc solution that absorb water by osmosis
3-Mechanical digestion occurs by teeth or bile juice (to increase surface area of food) , while chemic digestion by enzymes
4-Non digestive enzyme without it , all enzymes not work is Sodium bicarbonate
5)Vein contain valve to prevent backflow of blood
6)PGal is formed from catabolism in cytoplasm (glycolysis) and anabolism in chloroplast stroma
7)Heart beats sound : Ventricle contraction (Lupp = Long and low pitch) / Dupp العكس high & short
8)Bell jar is covered by black cloth to prevent photosynthesis
9-NAD in cytoplasm and mitochondria while FAD in mitochondria only
10-Co2 is formed from respiration in mitochondria and excreted through pulmonary artery
11-Plant respiration is similar to animal respiration by same enzymes
12-Superior vena cava receive lymph and blood from upper part of body
13-RBC & platelets doesn't have nucleus or chromosomes , while WBC has .
14-Vagus nerve decrease heart beats
15-Systolic = high pressure when ventricles contract / Diastolic = low pressure when atrium contract