Form 5 BIOLOGY MEANINGS

CHAPTER 1: ORGANISATION OF PLANT TISSUE AND GROWTH

CHAP	TERM	MEANING	T.B.PAGE
1	Lignin	An organic polymer that provides mechanical support to plant tissues.	293
1.1	Permanent Tissues	matured tissues which have experienced or experiencing differentiation.	4
1.1	Parenchyma tissues	simplest living cells and do not undergo differentiation.	5
1.1	Collenchyma tissues	made of living cells which mature into cells that are flexible.	5
1.1	Sclerenchyma tissues	consists of dead cells when they are matured.	5
1.1	Xylem tissues	made up of dead cells without the cytoplasm.	5
1.1	Phloem tissues	made up of companion cells and sieve tubes.	5
1.1	Pectin	material found in cell wall of plant	5/294
1.2	Primary growth	the growth that occurs after germination and it takes place in all plants to elongate their stems and roots.	10
1.2	Secondary growth	occurs mainly in eudicots and a small number of monocots (shrubs) to increase the circumference or diameter of plant stem and root.	10
1.3	Annual plants	plants that have only one life cycle for a season or a year.	17
1.3	Biannual plants	plants which take two years with two seasons of growth to complete their life cycle.	18
1.3	Perennial plants	plants that live for more than two years.	18

CHAPTER 2: LEAF STRUCTURE AND FUNCTION

CHAP	TERM	MEANING	T.B.PAGE
2.3	Transpiration	a process of water loss in the form of water vapor through evaporation from the plants to the atmosphere.	36
2.4	Thylakoid	the disc-shaped sac containing chlorophyll.	42
2.4	Granum	a disc-shaped stack of thylakoids.	42

2.4	Stroma	colourless fluid surrounding the granum in the chloroplast.	42
2.5	Compensation point	Level of light intensity when rate of respiration equals to the rate of photosynthesis	52

CHAPTER 3: NUTRITION IN PLANTS

CHAP	TERM	MEANING	T.B.PAGE
3.1	Auxin	Plant hormone that is involved in cell growth at the tip of a shoot	293
3.1	Chlorosis	A condition in which leaves turn yellow due to insufficient production of chlorophyll	
3.3	Nutrition	a process of organisms obtaining energy and nutrients from food for the growth, maintenance, and repair of damaged tissues.	68
3.3	Parasitic plants	plants that live by growing on other plants which are hosts.	68
3.3	Epiphytic plants	green plants which live on other plants which are the hosts.	68
3.3	Carnivorous plants	plants that are able to synthesize their own food by carrying out photosynthesis.	69

CHAPTER 4: TRANSPORTATION OF PLANTS

CHAP	TERM	MEANING	T.B.PAGE
4	Lignin	organic polymer that provides mechanical support to plant tissues.	293
4.1	Vascular plants	are plants that have a transport system.	76
4.1	Non-vascular plants	are plants that do not have a transport system.	76
4.2	Capillary action	water potential to move upwards against gravity in the stem with the help of adhesion and cohesion forces.	79/293
4.2	Guttation	secretion of water droplets through a special structure at the end of the leaf veins without involving the stomata caused by a high root pressure.	84
4.3	Translocation	a process of transporting organic substances such as sucrose, amino acids, and hormones in the phloem from the leaves to other parts of the plant such as the roots and stem.	86

4.4	Phytoremediation	one of the treatment methods which uses plants for the purpose of degradation, extraction, or elimination of polluted substances from soil and water.	89

CHAPTER 5: RESPONSE OF PLANTS

CHAP	TERM	MEANING	T.B.PAGE
5.1	Tropism responses	the responses of certain parts of a plant such as roots and shoots that respond towards or away from a stimulus	98
5.1	Thigmotropism	the plant response to touch.	99
5.1	Geotropism	the plant response to gravity.	99
5.1	Hydrotropism	the plant response to water.	100
5.1	Phototropism	the plant response to light.	100
5.1	Chemotropism	the plant response to chemical	100
5.1	Seismonasty	a plant response that occurs due to a mechanical stimulus such as shock, touch, wind, and raindrops	101
5.1	Nyctinasty	a circadian rhythm that responds towards the onset of darkness.	102
5.1	Thermonasty	the plant response towards changes in the surrounding temperatures	102
5.1	Thigmonasty	the plant response towards vibration	102
5.2	Phytohormones	or plant hormones are chemical substances that stimulate and coordinate responses in plants, at low concentrations.	103

CHAPTER 6: SEXUAL REPRODUCTION IN FLOWERING PLANTS

CHAP	TERM	MEANING	T.B.PAGE
6.1	Hermaphrodites	bisexual flowers where both male and female reproductive organs are within the same flower	114
6.2	Ovules	A structure that gives rise to and contains the female reproductive cells; it is a structure in a flower that is formed inside the carpel.	119/294

6.2	Funicle	a stalk that attaches the ovule to the ovary wall through it.	119
6.2	Placenta	the area of attachment of the funicle to the ovary.	119
6.2	Nucellus	a central part of a plant ovule which contains an embryo sac.	119/294
6.2	Integument	nucellus tissue that develops into two layers	119
6.2	Micropyle	a little opening at the end of the integument	119
6.3	Pollination	the process in which pollen grains are transferred from the anther to the stigma	120
6.4	Simple fruit	the fruit develops from a single carpel or several carpels fused together in a single flower.	126
6.4	Aggregate fruit	the fruit develops from numerous carpels in a single flower.	126
6.4	Multiple fruits	the fruit develops from the carpels of a cluster of flowers.	126
6.4	Accessories fruit	the fruit develops from a tissue that is not in the ovary but from some tissues near the carpel	126

CHAPTER 7: ADAPTATIONS OF PLANTS IN DIFFERENT HABITATS

CHAP	TERM	MEANING	T.B.PAGE
7.1	Adaptation	the adjustment of an organism to the environment.	134
7.1	Mesophyte	a plant that needs only a moderate amount of water	135
7.1	Pneumatophore	Short root projections from the soil surface for aeration in water-submerged areas	136/294
7.1	Aerenchyma tissues	The stem of a plant which consists of light tissues with of plenty air spaces between the cells.	137
7.1	Submerged plants	plants that grow completely inside the water	137

CHAPTER 8: BIODIVERSITY

CHAP	TERM	MEANING	T.B.PAGE
8.1	Taxonomy	a field in biology which involves the classification, identification, and naming of organisms in an organized manner.	144

8.1	Classification	organisms are categorized based on physical features in a taxonomic hierarchy system.	144
8.1	Identification	organisms are identified using dichotomous keys.	144
8.1	Naming	organisms are named using a binomial nomenclature system.	144
8.1	Prokaryote	a type of cell which lacks a membrane-bound nucleus and membrane-enclosed organelles	145
8.1	Eukaryote	has a nucleus and membrane-enclosed organelles.	145
8.1	Heterotroph	an organism that cannot synthesise its own food but obtains food molecules by eating other organisms.	145
8.1	Autotroph	an organism that can synthesise its own food from organic materials by using light energy or chemical energy.	145
8.1	Unicellular	single-celled	145
8.1	Multicellular	more than one cell	145
8.1	Domain	the highest taxonomic rank of organisms in the hierarchical biological classification system.	148
8.1	Dichotomous key	a tool used by taxonomists to identify organisms based on similarities and differences.	150
8.2	Genetic diversity	the genes variation of an individual within a population and the genes variation between different populations of the same species	152
8.2	Species diversity	the variation and the variability of organisms on Earth.	152
8.2	Ecosystem diversity	the biotic community and ecological process in ecosystems on the land, in the sea and other aquatic environments.	152
8.2	Phylogeny	the evolutionary history of a species or a group of organisms that are genetically linked.	153
8.2	Homologous structure	a structure (body parts or body anatomy) that can be observed across multiple organisms which share the same ancestor even though the function of the structure may differ from one organism to another	153
8.2	*In situ* conservation	maintains species in their natural habitats.	154

8.2	*Ex situ* conservation	efforts to conserve species found outside of their natural habitats.	154
8.3	Saprophytic fungi/saprophytic bacteria	are important microorganisms that decompose organic materials from dead organisms.	160
8.3	Symbiont	an organism which has a close relationship with another organism (known as the host).	161
8.3	Ectosymbiont	lives outside the host cells.	161
8.3	Endosymbiont	lives inside the host cells.	161
8.3	Pathogen	an organism which causes diseases.	162
8.3	Vectors	are organisms which transmit pathogens and cause certain diseases.	163

CHAPTER 9: ECOSYSTEM

CHAP	**TERM**	**MEANING**	**T.B.PAGE**
9.1	Habitat	the natural surrounding or the living place of an organism.	170
9.1	Abiotic components	All the non-living elements including their physical and chemical characteristics that can affect an organism in an ecosystem	293
9.1	Species	a group of similar organisms, able to interbreed and produce off springs	171
9.1	Population	a group of organisms of the same species which live in the same habitat.	171
9.1	Community	the populations of all organisms from different species living in the same habitat whilst interacting with each other	171
9.1	Ecosystem	a few communities that live together in a habitat and interact with each other including non-living components (abiotic) such as water, air, and soil	171
9.1	Niche	the role of an organism in an ecosystem which includes its behaviour and interactions with biotic and abiotic components in the surrounding of its habitat.	171
9.1	Ecological niche	the role of a species in its surroundings.	171
9.1	Species niche	the way in which a species interacts with biotic and abiotic components within its surroundings.	171

9.1	Topography	the physical characteristics on the surface of the Earth which include altitude, gradient and aspect.	174
9.1	Microclimate	refers to the climate condition of a small area which is different from the surrounding area.	174
9.1	Air humidity	is the quantity of water vapour in the air which affects the distribution of organisms in a habitat.	175
9.1	Nutrition	a way for an organism to obtain nutrients and energy from the food for its life processes	175
9.1	Photoautotroph	an organism that synthesises complex organic compounds from carbon dioxide together with light energy.	176
9.1	Chemoautotrophic	an organism which synthesise organic compounds without using light.	176
9.1	Saprotrophic	saprophytic organisms which gain their nutrients from dead and decaying organic substances.	176
9.1	Holozoic	an organism that survives by eating solid organic substances which are then digested and absorbed into the body	176
9.1	Parasitic	are organisms that absorb nutrients from the hosts.	176
9.1	Biotic components	are the organisms that need energy to carry out life processes.	177
9.1	Food chain	is the sequence of energy transfer from one trophic level to another trophic level, beginning with the producers.	178
9.1	Pyramid of numbers	is a diagram which shows the number of organisms at every trophic level in a food chain.	180
9.1	Pyramid of biomass	is a diagram which shows the total biomass per unit area of all organisms in every trophic level.	180
9.1	Pyramid of energy	demonstrates the total energy which is present in an ecosystem	181
9.1	Saprophytism	an interaction in which an organism gets its food from dead organic materials.	182
9.1	Symbiosis	different species that live together, interact with each other	182
9.1	Mutualism	an interaction that gives benefits to both organisms.	182

9.1	Commensalism	an interaction that provides benefits to only one organism without causing any harm to the other organism	182
9.1	Predation	an interaction involving an organism (predator) that eats another organism (prey).	183
9.1	Competition	organisms in a habitat compete in order to get basic needs such as food, water, light and mates	183
9.1	Interspecific competition	competition among different species	183
9.1	Intraspecific competition	competition among the same species	183
9.1	Parasitism	an interaction that benefits one organism but harms the other organism.	183
9.1	Pioneer species	a species that begins to colonise an area where there are no other living things.	188
9.1	Coastal zone	is the area that is most exposed to big waves.	188
9.1	Middle zone	is situated along the river, closer to the estuaries.	188
9.1	Inland zone	is situated further into the land.	188
9.2	Population size	the number of organisms present in a population.	192
9.2	Population density	the number of individuals of a species per unit area of a habitat.	192
9.2	Quadrat	a square-framed structure which is made of wood, iron, or plastic.	192

CHAPTER 10: ENVIRONMENTAL SUSTAINABILITY

CHAP	TERM	MEANING	T.B.PAGE
10.1	Environmental sustainability	an environmental condition that remains the same without any reduction or depletion of natural resources, with an assured quality of the surrounding environment, for a long period of time.	202
10.1	Climate change	the change in temperature of the earth, rainfall distribution and drastic changes of the winds	203
10.1	Deforestation	the action of clearing a wide area of trees in a large scale.	204
10.1	Eutrophication	a process that occurs when the water ecosystem becomes rich with nutrients, resulting in changes to the structure of the ecosystem.	205

10.1	Biochemical oxygen demand (BOD)	the total amount of oxygen needed by microorganisms such as bacteria and fungi to decompose organic materials in water.	206
10.1	Air pollution	an increase in the pollutant substances such as gases, smoke, dust, and particles in the atmosphere which affect health and lives of human beings, animals, and plants.	208
10.1	Thermal pollution	the deterioration of water quality due to excessive heat dissipation into water caused by processes that change the water temperature.	209
10.1	Noise pollution	sounds that disturb and cause detrimental effects to the health of humans and animals.	210
10.1	Population growth explosion	the increase in total number of humans living in a certain area	210
10.2	Preservation of an ecosystem	the efforts made to protect the components of an ecosystem so it will remain in its natural condition	212
10.2	Conservation of an ecosystem	the efforts to restore environmental resources such as water, forests, energy, air, minerals, among others so they will continue to exist	212
10.2	Restoration of an ecosystem	efforts for renewing and restoring natural ecosystems that have deteriorated, damaged, or destroyed due to human activities.	212
10.3	Food security	having an assurance on the availability of food, as well as sufficient access to food and safe food utilisation.	217
10.3	Halal	an important element in determining the status of food security	217
10.4	Green technology	the development and application of products, equipment, and system to preserve the environment and nature while minimising or reducing the negative impacts of human activities.	218

CHAPTER 11: INHERITANCE

CHAP	TERM	MEANING	T.B.PAGE
11.1	Monohybrid inheritance	inheritance of one characteristic and contrasting traits controlled by a gene.	230

11.1	Gene	the basic unit of inheritance which consists of a DNA segment located on a specific locus of a chromosome	232
11.1	Allele	an alternative form of a gene for a specific trait that is located on the same locus of a pair of homologous chromosomes.	232
11.1	Phenotype	the observable characteristic of an organism.	232
11.1	Genotype	the genetic composition of an organism that cannot be seen.	232
11.1	Characteristic	a heritable feature such as height, eye colour, blood group, and presence of dimples.	232
11.1	Trait	a variation of a specific characteristic	232
11.1	Dominant allele	an allele which always shows its trait when it is present, and suppresses the effect of recessive allele.	233
11.1	Recessive allele	an allele which shows its trait when both alleles are recessive allele.	233
11.1	Dominant trait	expressed when both alleles are dominant alleles or one dominant allele is paired with a recessive allele.	233
11.1	Recessive trait	expressed if a recessive allele is paired with another recessive allele.	233
11.1	Homozygote	both alleles at loci of a pair of homologous chromosomes are the same.	233
11.1	Heterozygote	alleles at loci of a pair of homologous chromosomes are different	233
11.1	Parental generation	the first generation of two individuals which are mated to predict or analyse genotypes of their offsprings.	233
11.1	Filial generation	a successive generation as a result of mating between individuals of purebreed parental generation	233
11.1	Purebreed	individual which carries two identical alleles for a trait.	233
11.1	Hybrid	the product of mating between two purebreed varieties.	233

11.1	Mendel ‘s First Law	a characteristic of an organism is controlled by a pair of alleles, and only one of the allelic pair is inherited in a gamete.	237
11.2	Dihybrid inheritance	involves the inheritance of two characteristics, each characteristic is controlled by a different gene located at a different locus.	238
11.2	Mendel’s Second Law	during gamete formation, each allele from a pair of alleles can combine randomly with any allele from another pair of allele.	239
11.3	Locus	is a specific location of a gene in a chromosome.	240
11.4	Karyotype	the number and structure of chromosomes present in a cell nucleus	242
11.4	Colour blindness	a condition in which a person cannot differentiate some specific colours such as red and green	248
11.4	Haemophilia	a condition in which blood cannot clot in normal circumstances due to the lack of blood clotting factor.	249
11.4	Family pedigree	a flowchart through a few generations to show ancestral relationship and inheritance of characteristics from ancestors to individuals in the present generation.	250

CHAPTER 12: VARIATION

CHAP	**TERM**	**MEANING**	**T.B.PAGE**
12.1	Variation	the differences in characteristics found within the same population or species.	256
12.1	Continuous variation	the variation in which the difference in the characteristic is not distinct.	258
12.1	Discontinuous variation	shows distinct differences in characteristic	259
12.1	Mutation	a permanent change which occurs spontaneously on genes or chromosomes.	263
12.1	Mutagen	a physical, chemical, or biological agent that can cause mutation or increase the rate of mutation to a dangerous level.	269/294
12.3	Chromosomal mutation	changes to the chromosomal structure or changes to the chromosomal number.	271

CHAPTER 13: GENETIC ENGINEERING

CHAP	TERM	MEANING	T.B.PAGE
13.1	Genetic engineering	a gene manipulation technique to modify an organism's genetic material to produce new combination of genes.	280
13.1	Transgenic organism	an organism that contains recombinant dna	280
13.1	Genetically modified food	possesses DNA from other species of plant or animal.	281
13.1	Insulin	an important hormone which controls blood glucose levels.	282
13.2	Biotechnology	a field which utilizes technology or method to manipulate organisms for the production of biological products.	284
13.2	Gene therapy	used to treat or prevent genetic diseases.	285
13.2	DNA profiling	a technique used in forensics to identify individuals, based on their DNA.	286
13.2	Bioremediation	a method that uses bacteria to clean up environmental pollutants.	288

GLOSSARY (not found within the textbook pages) (find their respective chapter yourself too!)

CHAP	TERM	MEANING	T.B.PAGE
	Autotrophic plant	a plant that can form its own food by synthesizing complex organic compounds from simple inorganic substances.	293
	Biotic components	living components in an ecosystem.	293
	Micro balance	a balance that can measure accurately a very small mass up to 0.1 milligram	293

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