

STUDENT MADE MEMO

BLG1502

MAY JUNE 2018

QUESTION 1

1. D
2. C
3. C
4. D
5. D
6. X
7. D
8. D
9. C
10. D

QUESTION 2

2.1 Phylogeny is the similarities that species share in their physical and genetic characteristics that they may share or differ in due to evolution. A phylogenetic tree is a branching diagram that is used to show evolutionary relationships between species or the phylogeny that they show.

2.2

Monophyletic	Paraphyletic
Is a group of organisms that all came from a common ancestor, they often share characteristics.	Is a group of organisms that come from a common evolutionary ancestor but not including all the descendant groups.
Includes a single common ancestor not many like a paraphyletic taxon.	Includes all the common ancestors from most recent to earliest,

2.3

Homology	Homoplasy
Is the existence of a shared ancestry between a pair of structures genes or taxa. It is the product of divergent evolution when a species splits into 2 or more species that exist at the same time. DIVERGE	Homoplasy is a character shared by a set of species but not present in their common ancestor.
	Due to convergent evolution, 2 or more species become one. CONVERGE

2.4

Orthologous genes	Paralogous genes
Are genes of a different species that evolved from a common ancestral gene by specification.	Are homologous genes that have evolved by duplication and have similar but not identical

They normally retain the same function.
SAME FUNCTION

functions.
DIFFERENT FUNCTION

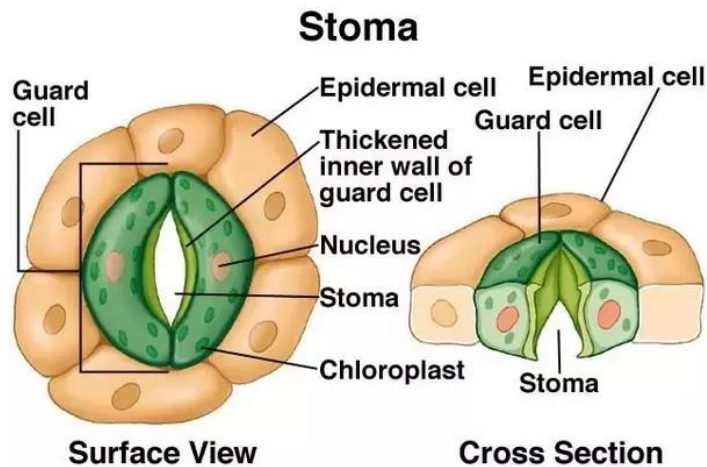
2.5

The three major branches on the tree of life are ARCHAE, EUBACTERIA, EUKARYOTES

QUESTION 3

3.1 Stomata is a small opening on the underside of a leaf that plays a part in photosynthesis and transpiration. The stomata's opening is where carbon dioxide is taken in from the atmosphere and oxygen is released as a waste product. The stomata can open and close to regulate the intake and

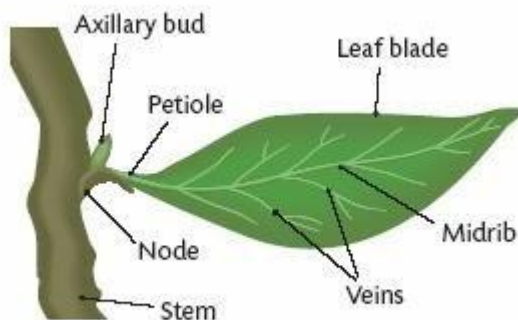
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exit of O₂ and CO₂.

3.2 Guard cells are positioned around the opening of the stomata they help to regulate the rate of transpiration by opening and closing the stomata. They are like an inflatable set of doors that can change their shape to open or close the stomata. They change their shape depending on the amount of H₂O and potassium ions that are present in the cell.

3.3 Petiole is the stalk that joins the leaf to the stem.



QUESTION 4

Name	Function
Prop root	Root that is above ground

Buttress root	Roots that support either side of a tree they grow out along the trunk and into the ground.
Strangling Aerial root	They wrap around a host tree and strangle it
Storage root	Store water and nutrients
Pneumatophore	Air roots that enable water plants to obtain oxygen by projecting above the waters surface.

QUESTION 5

5.1 The Medulla oblongata monitors the PH of the cerebrospinal fluid that it is bathed in and will react to any change that occurs. When a lot of CO₂ is in the blood it diffuses into the cerebrospinal fluid and will react with H₂O and carbonic acid and form many hydrogen ions that will change the PH of the blood. So, an increase in blood CO₂ will result in an increase of CO₂ in the cerebrospinal fluid. A higher concentration of H⁺ will cause a lower PH that the medulla will react to. The sensors in the medulla and the major blood vessels react to this change, as a result the breathing rate will increase. And will stay that way until the CO₂ is eliminated in exhaled air and the PH returns to a normal value.

Before the CO₂ is exhaled and the blood PH has been affected due to high CO₂ concentration it needs to be released by respiring cells and transported to the blood plasma where it binds to the haemoglobin in the erythrocytes and reacts with water to form H⁺ which the medulla would react to as explained above. The CO₂ binds to the haemoglobin in the erythrocytes and the blood flows through the lungs and alveoli. Gas exchange will occur due to the partial pressure of the CO₂ being a higher concentration in the blood then in the alveoli of the lungs. And because of the difference in partial pressure the CO₂ will diffuse from the blood into the alveoli and the amount of CO₂ in the blood decreases as the CO₂ is exhaled from the body.

5.2 Homeostasis is the word given to the body carrying out various tasks in order to maintain a constant internal environment in response to environmental changes such as PH regulation, temperature, concentration of blood glucose levels, etc. The nervous and endocrine systems control homeostasis, with receptors that respond to a change in environment that would travel to alert the body through a negative feedback mechanism that would involve various organs and organ systems that would cause a response in the body in various ways to cancel out the change and maintain a constant internal environment. With hormonal, physical (such as sweating) and cellular responses. For example, the pancreases response to too much glucose in the blood, the medullas response to a change in PH in the cerebrospinal fluid or the blood vessels dilating or constricting in response to a change in temperature.

QUESTION 6

6.1 FSH, LH, TSH, prolactin, growth hormone, adrenocorticotrophic hormone

6.2 testosterone, oestrogen, progesterone, androgen

6.3 aldosterone, adrenaline, cortisol, adrenocorticotrophic hormone

6.4 melatonin

QUESTION 7

Monocotyledons	Dicotyledons
1 cotyledon	2 cotyledons
Vascular tissue is complexly arranged	Vascular is arranged in a ring
Veins are parallel	Veins are netlike
3 multiples of floral parts	4 or 5 multiples of floral parts
Fibrous root system	Taproot system

7.2

Specific mechanisms	Non-specific mechanism
-Humoral immune response and cellular immune response that provide antibodies and defences cells against specific antigens. A particular antibody is created in response to a specific antigen!	Fight against any type of antigen, they are non-specific. And have a series of defence mechanisms such as a skin barrier against foreign agents, mucous membranes, ciliated epithelium, inflammatory response and the action of the nonspecific proteins and defence cells (macrophages). Has no specific response

7.3

Cytokines	Interferons
An inflammatory response is activated when a macrophage discharges cytokine, signalling other molecules to recruit neutrophils to the site of the injury or infection. The cytokines are cells that carry signals for the body to perform various Immunol responses.	Innate defence by interfering with viral infections. The virus infected body cells produce interferon that tell other cells in the body to produce a substance that inhibits viral replication. They limit the cell to cell spread of the virus in the body this helps to control viral infections. Part of the complement system

7.4 The infection fighting complement system has 30 proteins in the blood plasma.

The first function of the complement system is when these proteins circulate in an inactive state and are activated by substances on the surface of many pathogens. Activation results in a cascade of biochemical reactions that can lead to bursting of the invading cell.

The complement system also functions in the inflammatory response as well as adaptive defences.

QUESTION 8

8.1 (not in study guide)

Chondrichthyes are sharks

Osteichthyes are bony fish

8.2

Closed Circulatory system	Open circulatory system
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<p>The closed circulatory system has blood that is confined to blood vessels and a heart is used to pump this blood around the body to transport O₂ and nutrients to the organs and waste product/ CO₂ away from the organs to the kidneys and lungs to exit the body.</p> <p>The blood vessels are different sizes and have different wall thicknesses, the blood once pumped by the heart does not fill body cavities.</p> <p>The blood is contained at all times within the blood vessels.</p>	<p>Open circulatory system is when the organisms is bathed in a haemolymph fluid that is not confined to any organs. The entire internal cavity of the body has this haemolymph that flows freely through the body. The haemolymph is pumped into a body cavity called the haemocoel where the blood diffuses back to the circulatory system between cells. The haemolymph is pumped by a heart into the body cavity and bathes organs in the fluid.</p>
<p>Humans (common in vertebrates)</p>	<p>Spiders (common in arthropods)</p>