

MULTIPLE CHOICE QUESTIONS

In *Chlamydomonas*
the adult is haploid.

Question 2

In the moss life cycle, the sporophyte
consists of a foot, stalk and a capsule.

Question 3

Which one of the following is an incorrect contrast between dicotyledons (stated first) and monocotyledons (stated last)?
Stem vascular bundles scattered – stem vascular bundles in a ring

Question 4

An example of a connective tissue is the
blood.

Question 5

Connective tissue has
relatively few cells and a large amount of extracellular matrix.

Question 6

A cloaca is an anatomical structure found in many non-mammalian vertebrates, which function as
a common exit for the digestive, excretory, and reproductive systems.

Question 7

Regeneration, the regrowth of lost body parts, normally follows
fragmentation.

Question 8

Which feature(s) do ferns share with all other land plants?
Sporophyte and gametophyte life cycle stages

Question 9

Which of the following flower parts develops into a fleshy fruit?
Ovary

Question 10

The scientific discipline concerned with naming of organisms is called
binomial nomenclature.

Question 11

The gram stain is a procedure that microbiologists use to
infer the structure of a bacterial wall and bacterial response to antibiotics.

Question 12

Which of the following characteristics of plants is absent in the closest relatives, the charophytes?
alternation of generations

Question 13

The correct sequence from the most to the least comprehensive, of the taxonomic levels listed here is

kingdom, phylum, class, order, family, genus, species.

Question 14

Land plants no longer required water as a medium for reproduction with the evolution of

seeds and pollen.

Question 15

Which of these is found in seed plants?

1. Roots, stems and leaves
2. Complex vascular tissue
3. Pollen grains that are not flagellated
4. Retention of megasporophyte within the ovule
5. **All of these are correct.**

Question 16

The body is capable of catabolizing many substances as sources of energy. Which of the following would be used as an energy source only after the depletion of other sources?

Protein in muscle cells

Question 17

Animals require certain amino acids in their diet. An amino acid that is referred to as nonessential would be best described as one that

can be made by the animal's body from other substances.

Question 18

Folic acid supplements are important for pregnant women. Why?

Folic acid deprivation is associated with neural tube abnormalities in a fetus.

Question 19

To leave the digestive tract, a substance must cross a cell membrane. During which stage of food processing does this take place?

Absorption

Question 20

Which sequence of blood flow can be observed in either a reptile or a mammal?

Vena cava → right atrium → ventricle → pulmonary circuit

Question 21 Septic shock, a systematic response including high fever and low blood pressure, can be life threatening. What causes septic shock?

Certain bacterial infections

Question 22

An unknown organism was found in a park. It was one-celled, had no nuclear membrane around its DNA, and contained no mitochondria and no chloroplasts, it belongs to the _____ group.

Bacteria or archea

Question 23

Which one of the following is an incorrect contrast between dicotyledons (first stated) and monocotyledons (stated last)?

Stem vascular bundles scattered – stem vascular bundles in a ring.

Question 24

The primary function of a food is to
?

Question 25

Which of these is the most common compound in the cell wall of gram-positive bacteria
peptidoglycan

SCIENTIFIC TERM

An organism that is capable of both heterotrophy and photosynthesis

Mixotroph

The innermost layer of the cortex in plant roots, a cylinder one cell thick that forms the boundary between the cortex and the vascular cylinder

Endodermis

The use of living organisms to detoxify and restore polluted and degraded ecosystems

Bioremediation

The ovule-producing reproductive organ of a flower, consisting of the stigma, style and ovary

Carpel

A group of plant-like protists that is most closely related to plants

charophytes

A type of membrane-enclosed nucleus and membrane-enclosed organelles

Eukaryotic cell

The fluid outside the thylakoids

chloroplast

The use of living organisms to detoxify and restore polluted and degraded ecosystem

A long cellular protuberance that delivers sperm to the female gametophyte

Pollen tube

The transfer of pollen from a anther to a stigma

Pollination

The joint evolution of two interacting species, each in response to selection imposed by the other

Coevolution

The creation of offspring by the fusion of haploid gametes to form a zygote which is diploid

Sexual reproduction

The male gamete

Sperm

Asexual reproductions in which new individuals arise from outgrowths of existing ones

Budding

Asexual reproduction in which the body breaks in several pieces, some or all develop in complete adults

Fragmentation

COMPARE PARENCHYMA AND COLLENCHYMA WITH REGARDS TO:

- a) **STRUCTURE AND COMPOSITION OF THE CELL WALL.**
- b) **FUNCTIONS**
- c) **POSITIONS IN PLANTS**

An egg develops without being fertilized.

Parthenogenesis

	Parenchyma cells	Collenchyma cells
Structure and composition of the cell wall	<ul style="list-style-type: none">• Thin and flexible primary walls.• Most lack secondary walls.	Elongated cells. Thicker primary walls. Walls are unevenly thickened.
Functions	Perform most of the metabolic functions. Store starch.	<ul style="list-style-type: none">• Provide flexible support without restraining growth.• Help support young parts of the plant shoot.
Position in plants	<ul style="list-style-type: none">• Stems and roots.	<ul style="list-style-type: none">• Young stems and petioles.

(10)

NAME THE HORMONES OF:

6.1 Gonads

- Androgens (testosterone)
- estrogens (estradiol)
- progestins (progesterone).

(3)

6.2 Adrenal gland

- Epinephrine, norepinephrine
- glucocorticoids (cortisol)
- mineralocorticoids (aldosterone)

(4)

6.3 Pineal gland

- Melatonin hormone.

(1)

DESCRIBE AND COMPARE THE PROCESS OF CONDUCTION, CONVECTION, RADIATION AND EVAPORATION.

10)

- ❖ **Conduction** is the direct transfer of thermal motion (heat) between molecules of objects in contact with each other, as when a lizard sits on a hot rock.
- ❖ **Convection** is the transfer of heat by the movement of air or liquid past a surface, as when a breeze contributes to heat loss from a lizard's dry skin or when blood moves heat from the body core to the extremities.
- ❖ **Radiation** is the emission of electromagnetic waves by all objects warmer than absolute zero. For example, a lizard absorbs heat radiating from the distant sun and radiates a smaller amount of energy to the surrounding air.
- ❖ **Evaporation** is the removal of heat from the surface of a liquid that is losing some of its molecules as gas.

DISCUSS THE PROCESS OF HOMEOSTASIS

(7)

- Homeostasis means “steady state,” referring to the maintenance of internal balance.
- In achieving homeostasis, animals maintain a relatively constant internal environment even when the external environment changes significantly.
- For example, the human body maintains a fairly constant temperature of about 37 °C (98.6°F) and a pH of the blood and interstitial fluid within 0.1 pH unit of 7.4.

DISTINGUISH BETWEEN ANTIGENS AND ANTIBODIES

Antigen

Any cell that elicits a response from a B cell to a T cell.

Antibody

The binding of a B cell antigen receptor to an antigen is an early step in B cell activation, leading to formation of cells that secrete a soluble form of receptor, this secreted protein is antibodies.

DISTINGUISH BETWEEN REGULATORS AND CONFORMERS IN TERMS OF HOMEOSTASIS

An animal is a regulator for a particular environment variable if it uses internal mechanisms to control internal change in the face of fluctuation.

An animal is a conformer for a particular environment variable if it allows its internal condition to change in accordance with external changes in the variable.

MODIFIED ROOTS AND THEIR FUNCTIONS

Prop roots

-support tall, top heavy trees.

Storage roots

-store food and water in their roots.

Aerial roots

-seeds germinate in the branches of tall trees of other species and send numerous aerial roots to the ground.

Buttress roots

-aerial roots that look like buttresses, such as the ceiba tree in Central America give architectural support to obtain oxygen.

Pneumatophores

-by protecting the waters surface they enable the root system to obtain oxygen.

CHARACTERISTICS COMMON TO ALL LAND PLANTS

- apical meristems
- multicellular
- dependent embryos.
- alternation of generations

CHARACTERISTICS THAT DEFINE LAND PLANTS

- apical meristea
- walled spores produced in sporangla
- aliteratio of generatio
- multicular gamelangia
- multicular dependent embryos

COMPARE A CELL STRUCTURE OF A PROKARYOTIC CELL WITH A EUKARYOTIC CELL

STRUCTURE	EUKARYOTIC	PROKARYOTIC
1. membrane enclosed organelles	present	absent
2. golgi apparatus	present	absent
3. lysosomes & peroxisomes	present	absent
4. Plasma membrane	present	present
5. cytosol	present	present

(5)

SIMILARITIES BETWEEN PLANTS AND GREEN ALGAE

- both has eukaryotic cells
- both carry out photosynthesis
- cell wall made of cellulose
- chloroplasts with chlorophylls A and B

(5)

DISTINGUISH BETWEEN RADIAL AND BILATERAL SYMMETRY

Radial symmetry

-any imaginary slice through the central axis divides the animal into mirror images.
For example, sea anemone does not have a left side and a right side.

Bilateral symmetry

-it is when only one imaginary cut divides the animal into mirror-image halves.
E.g. lobster, has a left and a right side.

(4)

NAME THE 3 SUBPHYLA OF THE PHYLUM CHORDATA AND GIVE EXAMPLES OF EACH

- Urochordata (Tunicata) e.g. sea squirts.
- Cephalochordata (Lancelets) e.g. amphioxus.
- Vertebrata e.g. hagfishes. (6)

FOUR CHARACTERISTICS OF CHORDATA

- a notochord
- dorsal, hollow nerve cord
- pharyngeal slits
- muscular, post – anal tail

EXPLAIN HOW PHOTOSYSTEM HARVEST LIGHT

- A photosystem is composed of a reaction-center complex surrounded by several light-harvesting complexes.
- The reaction-center complex is an organised association of proteins holding a special pair of chlorophyll A, chlorophyll B and carotenoids bound to proteins.
- The number and variety of pigment molecules enable a photosystem to harvest light over a large surface area and a large portion of spectrum than could any single pigment molecule alone.
- Together, these light-harvesting complexes act as an antenna for the reaction-center complex.
- When a photon strikes a pigment molecule in a light-harvesting complex, the energy is passed from molecule to molecule until it reaches the reaction-center complex.
- Here, an excited electron from special pair of chlorophyll a molecules is transferred to the primary electron acceptor. **(10)**

EXPLAIN THE MECHANISM BY WHICH WATER RISES IN THE PLANT TO REACH THE LEAVES

- Adhesion and cohesion facilitate the transport of water bulk flow.
- Adhesion is the attractive force between water molecules and other polar substances. - Because both water and cellulose are polar molecules, there is a strong attraction between water molecules and the cellulose molecules in the xylem cell walls.
- Cohesion is the attractive force between molecules of the same substances.
- Water has an unusually high cohesive force due to the hydrogen bonds each water molecule can potentially make with other water molecules.
- It is estimated that water's cohesive force within the xylem gives it a tensile strength equivalent to that of a steel wire of similar diameter.
- The cohesion of water makes it possible to pull a column of xylem sap (water and dissolved minerals) from above without the water molecules separating. **(10)**

ALGAE

ADVANTAGES	DISADVANTAGES
Rich in proteins, minerals & nutrients can be used as fertilizers for better crops.	Algae sometimes block sunlight from reaching aquatic plants resulting in their deaths
Different kinds of algae is used in medication, cosmetics, livestock feed & for pollution.	Hair algae cause the deaths of aquatic animals due to strangulation.
Aquatic animals benefit from algae as they provide food for micro-organism on which fishes can feed.	The process of deriving bio fuel from algae is expensive & cannot be taken advantage of.
Provide shade to the aquatic animals living in the ponds & also enriches water with oxygen	Kills environmental beauty as the ponds covered in algae look dirty & ugly

DISTINGUISH BETWEEN OPEN AND CLOSED CIRCULATORY SYSTEMS AND GIVE AN EXAMPLE OF ANIMAL IN WHICH IT OCCURS, ALSO NAME THE THREE BASIC COMPONENTS COMMON TO BOTH SYSTEMS

Open circulatory system

- the circulatory fluid bathes the organs directly.
- In these animals, the circulatory fluid called hemolymph, is also the interstitial fluid that bathes body cells.
- Contraction of one or more hearts pump the hemolymph through the circulatory vessels interconnected sinuses, spaces surrounding the organs.
- Arthropods and most molluscs are examples of this system.

Closed circulatory system

- a circulatory fluid called blood is confined to vessels and is distinct from interstitial fluid. ----
- One or more hearts pump blood into large vessels that branch into smaller ones that infiltrate the organs.
- These animals include annelids, cephalopods and all vertebrates

Common to both:

- Circulatory fluid/blood
- Set of tubes/blood vessels
- Muscular pump/heart

(7)

DESCRIBE PULMONARY AND SYSTEMIC SYSTEMS

- The pumps for the two circuits are combined into a single organ, the heart. Having both pumps within a single heart simplifies coordination of the pumping cycle.
- One pump, the right side of the heart, delivers oxygen-poor blood to the capillary beds of the gas exchange tissues, where there is a net movement of O₂ into the blood and of CO₂ out of the blood.
- This part of circulation is called a pulmonary circuit, if the capillary beds involved are all in the lungs, as in reptiles and mammals.
- After the oxygen-enriched blood leaves the gas exchange tissues, it enters the other pump, the left side of the heart.
- Contraction of the heart propels this blood to capillary beds in organs and tissues throughout the body.
- Following the exchange of O₂ and CO₂, as well as nutrients and waste products, the now oxygen-poor blood returns to the heart, completing the systemic circuit. **(8)**

DESCRIBE THE FORMAT OF SCIENTIFIC NAMES AND EXPLAIN WHY BIOLOGISTS USE SCIENTIFIC NAMES

- scientific names follows a specific set of rules, scientists use a two-name system called a **binomial naming system**.
- to study the diversity of life, biologists use a classification system to name organisms & group them in a logical manner

ECOLOGICAL IMPORTANCE OF FUNGI

Fungi as decomposers

- well adapted as decomposers of organic material, including cellulose and lignin of plant cell walls.
- almost any carbon containing substrate such as jet fuel and house paint can be consumed by some fungi.

Fungi as plant mutualisms

- All plants studied to date appear to harbor symbiotic endophytes, fungi that live inside leaves & other parts of plants without causing harm.
- Endophytes benefit certain grasses & other woody plants by making toxins that deter herbivores or
- by increasing host plant tolerance of heat, drought or heavy metals.

Fungi as animal mutualisms

- Helps break down plant material in the guts of cattle and other grazing mammals.

Lichens

Highly intergrated symbiotic associations of fungi and algae or cyanobacteria.

LIST 5 DIFFERENCES BETWEEN MONOCOTYLEDONOUS AND DICOTYLEDONOUS PLANTS

MONOCOTYLEDONOUS	DICOTYLEDONOUS
1 cotyledon	2 cotyledon
Veins parallel	Veins netlike
Vascular tissue scattered	Vascular tissue in a ring
Fibrous root system	Taproot present
Pollen grain with 1 opening	Pollen grain with 3 opening