BIOLOGY 1 2002 - NECTA FORM FOUR

Solutions from: Maktaba by TETEA

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1.

i	ii	iii	iv	v	vi	vii	viii	ix	x
E	A	A	D	C	A	D	C		

2.

i	ii	iii	iv	v	vi	vii	viii	ix	x
I	L	G	S	N	R	P	E	B	C

3.(a)(i)- Artificial system: It is based on the limited number of characters of living organism and is use for primary identification of living organism.

Example: Plants – Herbs, shrubs and trees

Animals – Aquatic, terrestrial and aerial

MERITS.

_Artificial classificationare based on any arbitrary property of interest.

-Artificial classifications can be very useful because they specifically focus on properties of interest.

-They can also be easy to develop because they are typically based on properties that are easy to measure. This means that they are also relatively stable; once the classification has been established, it doesn't change a lot.

DIMERIT.

-A major disadvantage of artificial classifications is that they have little predictive value; arbitrarily selected properties do not necessarily correlate well with each other.

This generally means that they are of little use for purposes other than that for which they were designed.

-Natural system: It is based on the similarities and differences in the large number of characters and employed for plants and animals. Organisms are classified into plant kingdom and animal kingdom.

MERIT.

-Natural classifications can be used to predict proprties that are not related to the properties used to create the classification.This is because closely related organisms often share ancestral properties.

-They are broadly useful because of this predictive value; a classification need not have been designed for a specific purpose to be useful for it.

DEMERITS.

-A disadvantage is that sometimes closely related organisms can differ in important properties.

An example of this is pathogenic bacteria that are very closely related to non-pathogenic strains

-Another disadvantage is that it can be quite difficult to determine how organisms are related; consequently natural classification systems tend to change as new information becomes available.

(ii) Classification is important because it helps scientists to clearly identify species, study and observe them, and organize concentrated conservation efforts. It also assists as a way of remembering and differentiating the types of organisms, making predictions about organisms of the same type, classifying the relationship between different organisms, and providing precise names for organisms.

(b)(i) helps in photosynthesis process

(ii)helps to carry oxygen from on part to another in the body.

(iii)helps to break down fats to fatty acids.

4.(a)to make sure that there is no any contamination in the dish, and also to kill all unwanted germs.

(b) antibiotics are medications that destroy or slow down the growth of bacteria.

(c) Penicillins such as penicillin and amoxicillin · Cephalosporins such as cephalexin (Keflex) · Macrolides such as erythromycin.

(d)(i)antibiotic Y.

(ii)antibiotic Y because it has a large clear zone, indicating that more bacteria have dead.

(iii)antibacterial X.

(e)antibiotic Y was more powerful than X.

5.(a)(i) nose

(ii) 🎬 **ter out foreign particles.** Nasal hairs filters out dust, allergens, and pollen, which helps prevent them from entering your lungs.

🎬 **Humidify inhaled air.** Your nose warms and moisturizes the air you breathe in. This brings the air you inhale to body temperature, making it easier for your lungs to use.

🎬 **Produce nitric oxide**. During nasal breathing, your nose releases nitric oxide (NO). NO is a vasodilator, which means it helps to widen blood vessels. This can help improve oxygen circulation in your body.

(b)**Breathing** is the process of taking in oxygen and giving out carbon dioxide, process of exchange of O2 from the atmosphere with CO2 produced by the cells are called g**aseous exchange**, occurs in the body cells. commonly known as respiration.

6(a)-can cause death during delivery

-badly development of foetus in the uterus.

-delivery of o baby before the time of nine months.

(b) -It regulates menstrual cycles.

-It makes periods less painful.

-It reduces your risk of uterine cancer.

7(a)mean response time before drink = 0.25 + 0.20 + 0.15 + 0.10 + 0.05 + 0.05 + 0.05 + 0.05 + 0.10 + 0.10 = 1.1/10

=0.11 seconds

-mean response after drink = 0.40 + 0.40 + 0.35 + 0.35 + 0.30 + 0.30 + 0.35 + 0.35 + 0.30 + 0.30 =3.4/10

=0.34 seconds.

(b)the mean time of response increases due to drinking alcohol.

(c)-lead to obesity

-can cause death due to accidents

-make blood pressure increases.

8.(a) The main difference between epigeal and hypogeal germination is that in **epigeal germination**, the cotyledons emerge out of the soil during germination whereas, in **hypogeal germination**, the cotyledons remain inside the soil. This means the hypocotyl shows a greater elongation in epigeal germination while the hypocotyl is short in hypogeal germination.

(b)(i) seed germination.

(ii)Dormancy helps seeds to remain alive in the soil for several years and provides a continuous source of new plants, even when all the mature plants of the area have died down due to natural disasters.

9.(a)(i) The water passes from the soil to the root by osmosis. There is greater water potential in the soil than in the cytoplasm of the root hair cells. As the cell's surface membrane of the root hair cell is semi-permeable, osmosis can take place; and water passes from the soil to the root hairs.

(ii)xylem tissue.

(iii)The role of magnesium in the soil

Magnesium is **the central core of the chlorophyll molecule in plant tissue**. Thus, if Mg is deficient, the shortage of chlorophyll results in poor and stunted plant growth. Magnesium also helps to activate specific enzyme systems.

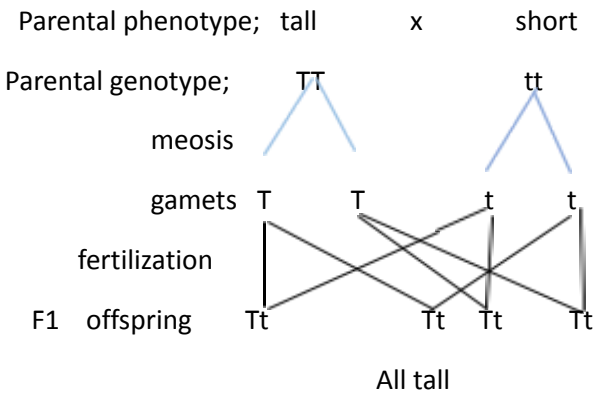
10.(a)(i) Cell A is MEIOSIS, cell B MITOSIS.

((ii) given; -

One parent homozygous dominant (TT)

Another parent homozygous recessive(tt)

Consider the following genetic crossing mechanism; -



All tall

(b) each egg and each sperm was generated by the process of meiosis, which begins with genetic recombination in the process called "crossing over." So each egg and each sperm have slightly different genetic information. This is why fraternal twins **look slightly different** from one another

10.pollution is the addition of unwanted materials in the environments.

Air pollution causes damage to crops, animals, forests, and bodies of water. It also contributes to the depletion of the ozone layer, which protects the Earth from the sun's UV rays. Another negative effect of air pollution is the formation of acid rain, which harms trees, soils, rivers, and wildlife.

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Living, working, or playing in contaminated soil can lead to respiratory diseases, skin diseases, and other health problems. Diseases caused by soil pollution include **Irritation of the skin and the eyes, Headaches, nausea, vomiting, Coughing, pain in the chest, and wheezing**.

-**toxic water that cannot be drunk** or used for essential purposes like agriculture, and which also causes diseases like diarrhoea, cholera, dysentery, typhoid.

11.

- Minimal Processing – Root Cellars, Cool Storage and Room Temperature Storage.
- Drying/Dehydrating.
- Canning – Water Bath Canning, Steam Canning and Pressure Canning. ...
- Freezing.
- Freeze Drying.
- Fermentation.
- Preserving in Salt and Sugar.
- Immersion in alcohol.

13.

Bacteria perform many important ecosystem services in the soil including improved soil structure and soil aggregation, recycling of soil nutrients, and water recycling.

- *Rhizobium* bacteria take nitrogen from the atmosphere and convert it to a form the plant can use. For plant use, the atmospheric nitrogen (N_2) or reactive nitrogen combines with oxygen to form nitrate (NO_3^-) or nitrite (NO_2^-) or combines with hydrogen to produce ammonia (NH_3^+) or ammonium (NH_4^+) which are used by plant cells to make amino acids and proteins.

-nitrogen fixing bacteria can process the nitrogen in the atmosphere into a form (fixed nitrogen) that plants can use. Nitrogen fixation occurs because these specific bacteria produce the nitrogenase enzyme. Nitrogen fixing bacteria are generally widely available in most soil types (both free living soil species and bacteria species dependent on a plant host).

-Nitrification is a process where nitrifying bacteria convert ammonia (NH_4^+) to nitrite (NO_2^-) and then to nitrate (NO_3^-). Bacteria and fungi are typically consumed by protozoa and nematodes and the microbial wastes they excrete is ammonia (NH_4^+) which is plant available nitrogen. Nitrite bacteria (*Nitrosomonas* spp.) convert the ammonia into nitrites (NO_2^-) and nitrate bacteria (*Nitrobacter* spp.) may then convert the nitrites (NO_2^-) to nitrates (NO_3^-).

-Denitrifying bacteria allow nitrate (NO_3^-) to be converted to nitrous oxide (N_2O) or dinitrogen (N_2) (atmospheric nitrogen). For denitrification to occur, a lack of oxygen or anaerobic conditions must occur to allow the bacteria to cleave off the oxygen. These conditions are common in ponded or saturated fields, compacted fields, or deep inside the microaggregates of soil where oxygen is limited. Denitrifying bacteria decrease the nitrogen fertility of soils by allowing the nitrogen to escape back into the atmosphere.

-In general, most soil bacteria do better in neutral pH soils that are well oxygenated. Bacteria provide large quantities of nitrogen to plants and nitrogen is often lacking in the soil. Many bacteria secrete enzymes in the soil to makes phosphorus more soluble and plant available. In general, bacteria tend to dominate fungi in tilled or disrupted soils because the fungi prefer more acidic environments without soil disturbance.