BIOLOGY 1 1998 - NECTA FORM FOUR

Solutions from: Maktaba by TETEA

By Yohana Lazaro

1.

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

2

i	ii	iii	iv	v	vi	vii	viii	ix	x
M	P	R	T	A	C	F	G	K	I

3. (a)(i)main parts of cell are nucleus, cytoplasm and cell membrane.

(ii)nuleus controls all cell functioning, cytoplasm helps to dissolve materials in cell cell membrane allows passage of only certain matetials in the cell.

(b)(i)nerve cells (neurons)

(ii)sperm cells

(iii)muscles cell

(iv)red blood cell

4. (a)(i)Insects provide useful services to mankind and the environment in a number of ways. They keep pest insects in check, pollinate crops we rely on as food, and act as sanitation experts, cleaning up waste so that the world doesn't become overrun with dung.

(ii)They have a direct impact on agricultural food production by chewing the leaves of crop plants, sucking out plant juices, boring within the roots, stems or leaves, and spreading plant pathogens. They feed on natural fibers, destroy wooden building materials, ruin stored grain, and accelerate the process of decay. They also have a profound impact on the health of humans and domestic animals by causing annoyance, inflicting bites and stings, and transmitting disease.

(b)(i) -tapeworm has strong suckers and hooks to attach on the small intestine lining.

-they are thin and flattered and have large surface area for ansorption of nutrients.

(ii)-they have scattered roots to minimize water loss

-they have high salt content to increase osmosis.

5. (a)(i)Breathing is the the action of moving air or water across the surface of a respiratory structure, such as a gill or lung, to facilitate respiration (the exchange of oxygen and carbon dioxide with the environment).

(ii)moves in and out of the lungs in response to differences in pressure. When the air pressure within the alveolar spaces falls below atmospheric pressure, air enters the lungs (inspiration), provided the larynx is open; when the air pressure within the alveoli exceeds atmospheric pressure, air is blown from the lungs (expiration). The flow of air is rapid or slow in proportion to the magnitude of the pressure difference. Because atmospheric pressure remains relatively constant, flow is determined by how much above or below atmospheric pressure the pressure within the lungs rises or falls.

(b) Significance of breathing through nose rather than through their mouth.

Air inhaled through the nose is both warmed and made moist at the same time. The nasal passages' delicate tissues are prevented from drying out and kept warm at the same time, which protects the nose's sensitive tissues.

Air which is exhaled through the nostrils becomes moisturized. This extra moisture reduces dehydration of the entire body, especially nasal tissues.

Air that is breathed directly into the lungs is not filtered. Breathing through the nose filters the air before it enters the body. Allergens, bacteria, viruses, etc. are filtered out of the body through the turbinates and other parts of the inside of the nose. The mucus of the airway linings collects potential contaminants where they are destroyed by nasal enzymes before they can enter the body and cause harm or make the body sick.

Breathing through the nose protects an individual's oral health. When an individual inhales through their mouth, the gums, tongue, and oral cavity become dried out, which causes excess acids in the mouth. Extraoral acids cause the gums and teeth to decay faster. A moisturized mouth remains healthier for the long term.

Breathing through a person's nose helps the facial muscles and bones develop correctly and helps develop straight teeth. When the mouth is closed, the tongue is in the proper position to help the jaw grow correctly, and teeth emerge in the right places.

Breathing through the nose lessens the chance of snoring, reduces the chance of sleep apnea by keeping the tongue in the correct place in the mouth, and helps give the individual a good night sleep.

6. (a)(i)insuline hormone

(ii) adrenaline hormone

(iii) androgen hormone

(iv)Auxin hormones

(b)Nervous System vs Endocrine system

Nervous System Endocrine System

-Electrical impulses are the messengers in the nervous system Hormones are the chemical

-messengers in the endocrine system that target cells through the bloodstream

-Brain and the spinal cord constitute the nervous system Glands and organs like thyroid, pituitary glands and reproductive organs (ovaries and testes) are involved in the endocrine system

Nerve impulses are transmitted through neurons Hormones are transmitted through blood vessels

The nervous system is under both voluntary and involuntary control The endocrine system is under involuntary control

Nerve impulses make use of the neurotransmitters at synaptic clefts and sodium and potassium channels and enter the target cells. The hormones enter into the target cells by diffusing through the plasma membrane or by binding to the cell receptors

Responses are localised Responses are widespread

7. (a)assume black colour be dominant,

(i)BB and WW

(ii)WW and WW

(iii)BW and BW

(iv)BB and WW

(b)lethal gene is gene that in some (such as homozygous) conditions may prevent development or cause the death of an organism or its germ cells.

8. (a)(i)A hepatic artery, B hepatic vein, C gall bladder, D bile duct, E hepatic portal vein

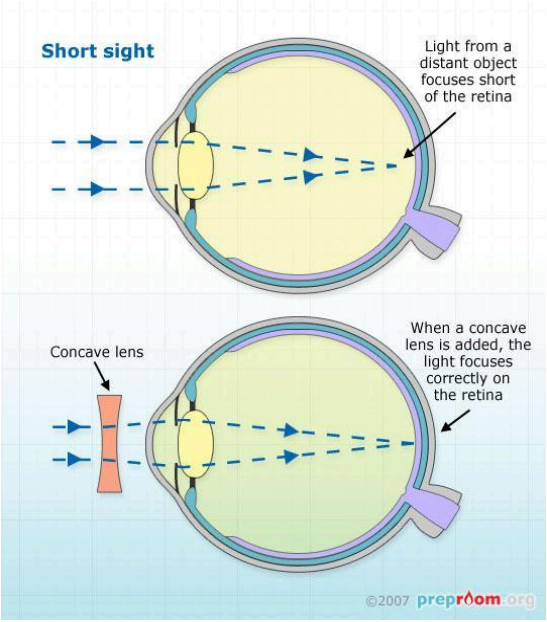
(ii)liver removes toxic materials in the blood stream.

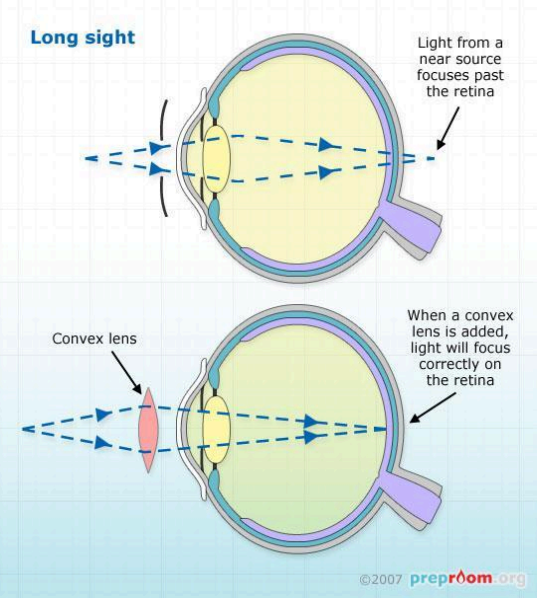
(b)- liver

-kidney

9. (a)Short-sightedness, or myopia, is a very common eye condition that causes distant objects to appear blurred, while close objects can be seen clearly.

Long-sightedness affects the ability to see nearby objects. You may be able to see distant objects clearly, but closer objects are usually out of focus.





www.preproom.org

(b)functions of the skin,

-help to sense touch

-acts as barrier for pathogens.

10.(a)parasite is the microorganism that enters in the body and cause harm, while predator is an animal that feeds to other animal, like lion.

(b)(i)Food chain is the sequence of feeding mode in which an organism is fed by the previous in the series.

(ii)Food web is the interconnection of many food chains to form one feeding system.

(iii)community is an interacting group of various species in a common location. For example, a forest of trees and undergrowth plants, inhabited by animals and rooted in soil containing bacteria and fungi, constitutes a biological community.

(iv) population is a subset of individuals of one species that occupies a particular geographic area and, in sexually reproducing species, interbreeds.

11. BACTERIA

Bacteria are microorganisms and they are useful to us. Bacteria are economically important as these microorganisms are used by humans for many purposes. The beneficial uses of bacteria include the production of traditional foods such as yogurt, cheese, and vinegar. Microbes are also important in agriculture for the compost and fertilizer production. Bacteria are used in genetic engineering and genetic changes.

1. Beneficial effects of Bacteria:

Bacteria play important roles in different fields such as agriculture, industry etc. Some of them are mentioned below:

A) Role in agriculture

a) Scavenging Role: Saprophytic bacteria obtain food from organic remains such as animal excreta, fallen leaves, meat etc. They decompose these substances by action of digestive enzymes aerobically or anaerobically (known as fermentation). Thus they help in sanitation of nature, so also known as scavengers. E.g. Pseudomonas

b) Nitrification:Rhizobium bacteria, living in root nodules of leguminous plant symbiotically, helps in fixing atmospheric nitrogen. Similarly, Nitrosomanas and Nitrococcus convert ammonium salt to nitrites. Nitrites are further changed to nitrates by Nitrobacter and Nitrocystis. It enables plants to uptake nitrogen.

c) Production of Organic Manure: As stated above, saprophytic bacteria help in breaking of complex organic substance to simpler forms. Thus, in this process, they help to convert farm refuse, dung and other wastes to manure.

d) Preparation of Ensilage:Ensilage is preserved cattle fodder prepared by packing fresh chopped fodder sprinkled with molasses. Fermentation activity of bacteria produces lactic acid that acts as preservative in ensilage.

e) Production of fuel: Bacteria, while converting animal dung and other organic wastes to manure, help in production of fuel that is a must in gobar gas plant.

f) Disposal of sewage: Bacteria help in disposal of sewage by decomposing it and thus, help in environmental sanitation.

B) Role in Industry

a) Dairy Industry: Bacteria such as Streptococcus lactis convert milk sugar lactose into lactic acid that coagulates casein (milk protein). Then, milk is converted into curd, yoghurt, cheese etc needed for the industry.

b) Production of Organic Compounds: Fermentation (breakdown of carbohydrate in absence of oxygen) action of various bacteria produces organic compounds like lactic acid (by Lactobacillus), acetic acid (by Acetobacter aceti), acetone (by Clostridium acetabutylicum) etc.

c) Fibre Retting: The action of some bacteria like Clostridium,

Pseudomonas etc. help in fibre retting i.e. separation of stem and leaf fibre of plants from other softer tissue.

d) Curing: The leaves of tea and tobacco, beans of coffee and coca are cured off their bitterness with the help of action of certain bacteria such as Bacillus megatherium.

e) Production of Antibiotics: Number of anti bacterial and anti fungal antibiotics such as Hamycin, Polymyxin, Trichomycin etc are obtained from mycelia bacteria (like Streptomyces). Similarly, Bacillus is used for production of antibiotics such as Bacitracin, Gramicidin etc

f) Production of Vitamins: Different kinds of vitamins are produced from bacteria like Riboflavin from Clostridium butylicum, Vitamin B12 from Bacillus megatherium and Vitamin K and B-complex from Escherichia coli.

2. Harmful effects of Bacteria:

Though bacteria plays important role in agriculture, industries and natural sanitation etc, it has the following harmful effects:

a) Food Spoiling: Saprophytic bacteria always not only help in decomposition of dead matters, but they also cause the rotting of vegetables, fruits, meat, bread etc.

b) Food Poisoning: Bacteria like Staphylococcus aureus cause food poisoning and cause people diarrhea and vomiting.

c) Damaging of domestic articles: Spirochete cytophaga deteriorates cotton, leather and wooden articles.

d) Denitrification: Bacteria such as Thiobacillus and Microbacillusconvert nitrate of the soil to the gaseous nitrogen. This hampers plants very much.

e) Desulphurication: Bacteria such as Desulfovibrio convert soil sulphates into hydrogen sulphide.

f) Cause of Diseases: It is known that over 90% of human diseases and over 10% of plant diseases are caused by bacteria

12.

(a) A sandy soil, B clay soil

(b)the soils are more acidic.

(c) Using basic materials like ash and other which will lower acidicity.

13.

1. The Burning of Fossil Fuels

Most of the air pollution takes place due to the burning of fossil fuels such as coal, oil, gasoline to produce energy for electricity or transportation. The release of carbon monoxide in high level indicates how much fossil fuel is burned. This also emits other toxic pollutants in the air.

2. Industrial Emission

Industrial activities emit several pollutants in the air that affects the air quality more than we can even imagine.

3. Indoor Air Pollution

Use of toxic products also called as Volatile Organic Compounds (VOCs), inadequate ventilation, uneven temperature, and humidity level can cause indoor air pollution, whether you are in office, school or at your comfortable home.

4. Wildfires

Climate change is not just increasing wildfire but also spiking air pollution. Burning stubble and farm residue is also a major contribution to wildfire.

6. Transportation

There is no denying that vehicle pollution is the major contributor to air pollution, especially in urban cities. When the car burns gasoline, it emits pollutants in the air which is as harmful as smoking 10 cigarettes a day.

7. Agricultural Activities

Agricultural activities have had a serious impact on the decreasing air quality. To begin with pesticides and fertilizers are the main source to contaminate the surrounding air.

8. Use of chemical and synthetic products

Talking about air pollution, we always consider outdoor air pollution dangerous for our lives but never talk about indoor air pollution.

Solutions to air pollution.

- Conserve the energy is the first step towards a better future with clean air to breathe.

-Understanding the concept and imbibing the habit of reducing, reuse, and recycle is crucial.

-Use public transport whenever it is feasible to save fuel and reduce vehicle pollution.

.