BIOLOGY 1 2011 - NECTA FORM FOUR

Solutions from: Maktaba by TETEA

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

2.

i	ii	iii	iv	v	vi	vii	viii	ix	x
R	B	L	M	D	M	N	S	O	P

3. (a) - Cell wall

- Vacuole

- Chloroplast

(b) It gives plant cells their shape;

Protects inner cell content;

It gives plants support.

Vacuole.

Absorbs water to provide turgidity and support in plant cells.

Stores substances in the cell

Can accumulate excretory substances for removal e.g. excretory vacuoles.

Chloroplasts

Facilitates photosynthesis.

4. (a) (i) Rhythmic contractions and relaxations of the alimentary canal muscles to facilitate movement of food down the gut for digestion, absorption and egestion.

(ii) If peristalsis stops, an animal will face constipation.

(b) Food rich in rouphages improves peristalsis since such a food contains fibres that encourage peristalsis

5. (a) Irritability is the ability of an organism to sense and respond to a stimulus.

(b) (i) Germinating seed

(i) Plumule grows upward against the force of gravity which acts downward whereas the radical grows downwards towards gravity.

A shoot of a potted plant will bend towards the window following the unilateral source of light, hence showing positive phototropism.

A zebra will run away from the direction of the incoming air to avoid the danger of a predator located on that side.

6. (a)

Renewable energy sources.

These are resources which are constantly replenished through natural processes and so they can never be depleted. Exampl include solar energy, wind, biogas and wave energy.

(ii) Non-renewable natural resources

These are resources which once used up cannot be replenish or their rate of replenishment is very low compared to the rate of consumption and so they will get depleted at one time in the future. Examples are coal, petroleum and wood.

7. (a) - Pelvic girdles

- Pectoral girdles

b) (i) Functions of limb girdles:

- Support the upper part of the body especially in bipeds

- Provide large surface area for attachment of muscles that move the leg/arm.

(ii) Ball and socket joints.

8. (a) (i) Legumes

-Peas, Beans

-Bacteria (nitrogen fixing)

-Symbiosis

-Close Marking Scheme

b) (i) Nitrate bacteria

Nitrite bacteria (Nitrosomonas and Nitrococcus)

Nitrate bacteria e.g. Nitrobacteria.

9. (a) Laboratory rules.

Never drink or eat in the laboratory;

Avoid running in the laboratory;

Keep the floor and desktop clean, dry and tidy;

Never do an unauthorized experiment;

Wear safety goggles during heating experiments;

Never taste any substance or chemical in the laboratory

(b) (i) Toxic substances can poison you and cause death immediately, after a few hours or after a few days.

Highly flammable substances can catch fire easily if not handled with care; a fire accident may break out.

Corrosive substances can burn ones skin. They can also corrode the floor and the desktop.

If they get into ones eyes the person can turn blind.

Radioactive substances - are those substances that can emits harmful rays which can affect some one and lead to cancer.

Biohazard - Are chemical substances that can result into death, deformations and mutations.

10. (a) (i])Kingdom Monera, Kingdom Protoctista, Kingdom Fungi, Kingdom Plantae, Kingdom Animalia.

The Malaria vector (mosquito) belongs to the kingdom Animals. The following are features of members of kingdom Animalia: They are eukaryotic multicellular organisms;

They are heterotrophs and feed by holozoic mode of nutrition

They are free-living;

Their bodies are differentiated into tissues and sometinies organs and systems;

They are capable of locomotion at least in one stage of their development;

They have a nervous system that facilitates them to respond to changes in their environment (Sponges are exceptional.

(b) (i) Liver fluke ,

(i) Tape worm

(iii) Kingdom Animalia

11. (a) Transpiration is the loss of water in the form of water vapour from the surface of the plant. It occurs through the stomata, lenticels and the cuticle.

(b) Importance of Transpiration

It results in the transport of water and minerals from the soil to the leaves where they form raw materials for photosynthesis.

It ensures that the walls of spongy mesophyll cells are kept moist which is essential for efficient absorption of carbon dioxide needed for photosynthesis.

Evaporation of water from the leaves has a cooling effect which helps to prevent direct sunlight from damaging delicate cells.

(c) Adaptations of plants to reduce water loss

Presence of stomata on the under-surface of leaves and flowers minimizes direct sunlight and wind and so reduces the rate of transpiration.

Presence of cuticles on the plant surface minimizes loss of water by evaporation. Presence of cork on the stem or plants minimizes water loss through stomata on the stem.

Shading of leaves during extreme weather conditions (too cold or too hot) prevents loss of water by transpiration.

Stomata closing during the night ensures that less water is lost during this time since no photosynthesis or cooling takes place.

Sunken stomata: Stomata are not on the surface of the plant but rather more sunken to avoid direct wind and sunlight and so minimizes evaporation.

12. Structure and function of blood tissue

Blood is a liquid connective tissue that transports useful materials to cells throughout an animals body and carries away waste products from cells to excretory organs.

Structure of blood

Blood consists of a liquid substance (plasma) into which living cells (blood cells), nutrients and other substances are dissolved or suspended.

Components of blood

Plasma: It is a pale yellow liquid that mostly consists of water. Its role is to act as a carrier of all other components of blood and since it is a liquid, it ensures fast and unimpeded movement throughout the body. Materials normally contained in plasma include dissolved salts and sugars (glucose), urea, hormones, blood proteins and dissolved gases. Plasma forms about 55% of blood.

Blood cells: They are the only living part of blood. Two types of blood cells are present - white blood cells and red blood cells.

White blood cells (Leucocytes) are colourless cells with nuclei whose role is to fight antigens that enter the human body. Leucocytes destroy any foreign body that enters the body by releasing chemicals known as antibodies or by engulfing the intruding bodies.

Red blood cells (RBCs): These are disc-shaped red cells whose role is to carry oxygen from the lungs to body cells and take carbon dioxide from body cells to the lungs. RBCs are the majority cells in the blood and their red colour gives blood its red appearance. They have no nucleus at maturity and are produced in the bone marrow. These cells increase the oxygen-carrying capacity of blood many times using a pigment known as haemoglobin that is present in them.

Platelets: T hese are irregularly-shaped bodies in the blood which originate from the bone marrow. They have no nucleus but play an important role in the clotting of blood.

Red blood cells Functions of blood

Transport of oxygen and food/nutrients to all cells in the body;

Carries away waste products of respiration and other processes from cells to excretory organs;

Distributes heat from where it is produced to other parts of the body (regulates temperature);

Transports hormones, antibodies and drugs throughout the body;

Protects the body against infection by foreign bodies. Blood forms the second line of the bodys defence.

13. (a) (i) Medulla oblongata

Controls involuntary responses e.g. breathing, blood circulation, etc.

Hypothalamus

Controls homeostatic process e.g. hunger, thirst, temper, blood sugar, pressure, etc.

Cerebellum

Coordinates body movements.

Maintains balance and posture.

It is involved in dexterity during fine movements e.g. playing a guitar.

Cerebrum

Thinking

Controls voluntary responses

Memory centre

Involved in learning, imagination, creativity and intelligence. Receives and coordinates impulses for sight, smell, hearing and speech.

(b) (i) Drug abuse refers to the intake of narcotics or medical drugs for effects other than treatment of diseases.

Effects of drug abuse

Overdose of medical drugs leads to poisoning of body tissues This can lead to death.

Abuse of medical drugs leads to weakening of the immune system.

Hard drugs interfere with mental health by causing damage or malfunctioning of some nerve cells in the brain.

Cocaine causes premature aging, convulsion and addiction.

Control measures against drug abuse

Participation in social and economic activities helps one to avoid idleness which could

drug abuse.

Proper counselling and guidance to young men and women against drug abuse.

Mass education on effects of drug abuse.