THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/1 **BIOLOGY PAPER 1**

Time : 3 Hours **ANSWERS** **Year : 2012**

Instructions

1. This paper consists of section A, B and C.
2. Answer **all** questions in section A and B and **one (1)** questions from section C.
3. Communication devices and any unauthorised materials are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

1. For each of the items (i) – (x), choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) Moss and liverworts are held in place by slender root like structures called:

A. hyphae

B. sporophytes

C. capsule

D. gametophyte

E. rhizoids

Answer: E. rhizoids

(ii) Which of the following structures carries hereditary material?

A. Cytoplasm

B. Nucleus

C. Ribosome

D. Membrane

E. Golgi apparatus

Answer: B. Nucleus

(iii) Night blindness is a deficiency disease caused by lack of

A. vitamin C

B. vitamin K

C. vitamin D

D. vitamin A

E. vitamin B

Answer: D. vitamin A

(iv) In plants xylem carries water and mineral salt from the soil to the

A. roots, stems and leaves

B. stem and leaves

C. roots only

D. stem and roots

E. stem only

Answer: B. stem and leaves

(v) Plant in mutual relations with nitrogen fixing bacteria receives

A. ammonium

B. amino acids

C. nitrate

D. nitrite

E. protein

Answer: C. nitrate

(vi) Grasses are known as producers because they

A. have green leaves

B. grow in the soil

C. contain chlorophyll

D. make their own food

E. make organic matter

Answer: D. make their own food

(vii) Which of the following is the end product of protein?

A. Amino acid

B. Glucose

C. Peptide

D. Pepsin

E. Glycerol

Answer: A. Amino acid

(viii) The function of an enzyme is to change the

A. chemical reactions

B. equilibrium of the reactions

C. material reactions

D. rate of chemical reaction

E. directions of reactions

Answer: D. rate of chemical reaction

(ix) The role of the auditory ossicles of the middle ear is to

A. pass on the sound vibrations

B. integrate the sound vibrations

C. magnify the sound vibrations

D. stimulate the sound response

E. receive the sound vibrations

Answer: C. magnify the sound vibrations

(x) Which of the following list contains the symptoms of malaria?

A. Anemia, cold, and diarrhea

B. Vomiting, dizziness and diarrhea

C. Shivering, dizziness and periodic fever

D. Loss of weight, dizziness and loss of weight

E. Diarrhea, vomiting and coughing

Answer: C. Shivering, dizziness and periodic fever

2. Match the responses in List B with the phrases in List A by writing the letter of the correct response from List B beside the item number of List A. Each choice in column B may be used once or not at all.

3. Here is the table copied exactly as it appears:

List A	List B
(i) They consist of cell wall made up of chitin materials.	A Animalia
(ii) Have dry bodies with horny scales.	B Osteichthyes
(iii) Have scaly and moist bodies.	C Amphibia
(iv) They breathe through lung books.	D Coelenterata
(v) Consists of organisms in which some parts of their bodies are covered by feathers and scales.	E Arachnida
(vi) Their bodies are covered with hairs and respiration is by lungs.	F Reptilia
(vii) External and then internal gills are present in their larval stages.	G Mammalia
(viii) They consist of exoskeleton to prevent desiccation.	H Fungi
(ix) They consist of cell membrane only no cell wall.	I Diplopoda
(x) They consist of cell wall made up of cellulose materials.	J Vetebrata
	K Chondrichthyes
	L Arthropoda
	M Chordata
	N Aves
	O Plantae

ANSWERS:

H, F, C, E, N, G, B, L, A, O

3. Figure 1 represents the development of embryo during pregnancy. Study the diagram and answer the questions that follow:

   (a) Name the part labeled A, B, C, D, E and F.

   A – Placenta

   B – Amniotic sac

   C – Amniotic fluid

   D – Umbilical cord

   E – Uterus wall

   F – Cervix

   (b) Briefly explain four functions of part A and one function of part E.

   Part A (Placenta) allows exchange of nutrients and oxygen from mother to fetus. It removes waste products like carbon dioxide from the fetus to the mother's blood. It acts as a barrier preventing harmful substances and some pathogens from reaching the fetus. It secretes hormones such as progesterone that maintain pregnancy.

   Part E (Uterus wall) provides protection and support for the developing embryo and fetus.

4. (a) (i) Define the term Biology.

   Biology is the branch of science that deals with the study of living organisms and their interactions with the environment.

   (ii) Name the two main branches of Biology.

   The two main branches are Botany (study of plants) and Zoology (study of animals).

   (b) State the importance of studying Biology.

   Biology helps us to understand living organisms and their functions. It contributes to medicine and health by explaining causes and control of diseases. It aids in agriculture by improving crops and livestock. It helps in conservation of the environment and natural resources.

5. (a) Explain the meaning of the following terms:

   (i) Analogous structure.

   These are structures in different organisms that perform the same function but have different evolutionary origins.

(ii) Fossil.
A fossil is the preserved remains or traces of an organism that lived in the past, found in rocks.

(b) (i) Outline two differences between Larmack's and Darwin's theories of evolution.
Lamarck believed in inheritance of acquired characteristics, while Darwin proposed natural selection as the mechanism of evolution. Lamarck emphasized use and disuse of organs, while Darwin emphasized survival of individuals best adapted to their environment.

(ii) Explain the meaning of the terms "natural selection" and "survival of the fittest" as used in evolution.
Natural selection is the process by which organisms better adapted to their environment tend to survive and reproduce more successfully. Survival of the fittest means that only organisms best suited to their environment survive and pass on their traits to offspring.

6. (a) Differentiate the following terms.
(i) Egestion from excretion.
Egestion is the removal of undigested and indigestible food materials from the digestive system.
Excretion is the removal of metabolic waste products such as urea and carbon dioxide from the body.

(ii) Vasodilation from vasoconstriction.
Vasodilation is the widening of blood vessels to increase blood flow. Vasoconstriction is the narrowing of blood vessels to reduce blood flow.

(b) Briefly explain how vasodilation and vasoconstriction regulates body temperature.
Vasodilation helps to cool the body by increasing blood flow to the skin, allowing more heat to escape. Vasoconstriction helps to conserve body heat by reducing blood flow to the skin and minimizing heat loss.

7. (a) (i) Mention the type of teeth found in human being.
Incisors, canines, premolars, and molars.

(ii) Draw a well labelled diagram of a tooth used for grinding food materials.
[Expected diagram of a molar showing crown, enamel, dentine, pulp cavity, root].

(b) State one function of each part of tooth labelled in (a)(ii) above.
Crown – used for grinding food.

Enamel – protects the tooth from wear.
Dentine – provides support and strength.
Pulp cavity – contains nerves and blood vessels for nourishment.
Root – anchors the tooth in the jaw.

8. (a) Differentiate between the tissue and the system.
A tissue is a group of similar cells performing a specific function. A system is a group of organs working together to perform a major function in the body.

(b) Draw a neat well labelled diagram of a plant cell.
[Expected diagram with cell wall, cell membrane, cytoplasm, nucleus, chloroplasts, vacuole, mitochondria].

9. (a) In what ways do the following differ from one another?
(i) Seed dormancy and seed viability.
Seed dormancy is the condition where a seed fails to germinate even under favorable conditions. Seed viability is the ability of a seed to germinate when provided with suitable conditions.

(ii) Hypocotyl and epicotyl.
Hypocotyl is the part of the embryo between the cotyledons and the radicle. Epicotyl is the part of the embryo above the cotyledons that develops into the shoot.

(b) (i) State two methods used by the farmer to break seed dormancy before sowing.
Mechanical scarification like cracking or scratching the seed coat.
Soaking seeds in water to soften the seed coat.

(ii) Briefly explain two conditions that are necessary for seed germination.
Water is required to activate enzymes and soften the seed coat. Oxygen is needed for respiration to provide energy for growth.

10. (a) (i) What do you understand by the term “locomotion”?
Locomotion is the ability of an organism to move from one place to another.

(ii) Briefly explain how insects and birds are adapted for locomotion.
Insects have jointed legs and wings that enable them to walk, crawl, and fly. Birds have feathers, wings, and lightweight bones adapted for flight.

(b) Name six major components of the human skeleton and briefly explain one function for each.
Skull – protects the brain.
Vertebral column – supports the body and protects the spinal cord.
Ribs – protect the heart and lungs.
Pelvic girdle – supports lower limbs and internal organs.
Pectoral girdle – attaches upper limbs to the body.
Limbs – enable movement and manipulation.

11. Describe the symptoms and control measures of any three common infectious diseases of the respiratory system in human.

One common infectious disease of the respiratory system is tuberculosis (TB). The main symptom of tuberculosis is a persistent cough that lasts for more than two weeks, often producing blood-stained sputum. Other symptoms include chest pain, night sweats, fever, fatigue, and weight loss. To control tuberculosis, patients should undergo a full course of anti-TB drugs as prescribed by doctors. Isolation of infected patients and vaccination with Bacillus Calmette–Guérin (BCG) also help prevent the spread of the disease. Public awareness campaigns and improved living conditions reduce the transmission of TB.

Another common disease is pneumonia. Pneumonia is characterized by symptoms such as difficulty in breathing, chest pain, coughing up mucus or pus, and high fever. Some patients also experience chills and fatigue. Control measures include vaccination against pneumococcal bacteria and influenza viruses, which reduce the chances of infection. Prompt medical treatment using antibiotics for bacterial pneumonia is essential. Good nutrition and maintaining proper hygiene, such as washing hands and avoiding crowded places, also reduce the risk of infection.

The third disease is influenza (commonly called flu). Symptoms of influenza include high fever, sore throat, dry cough, muscle aches, and general body weakness. In severe cases, it may lead to complications like bronchitis or pneumonia. Control of influenza involves vaccination with seasonal flu vaccines to protect against prevailing strains of the virus. Antiviral drugs may be prescribed for treatment in some cases. Preventive measures such as regular hand washing, covering the mouth when coughing or sneezing, and avoiding close contact with infected individuals are important in reducing the spread of flu.

12. Elaborate the mode of transmission and symptoms of cholera and suggest five ways in which the disease could be controlled.

    Cholera is primarily transmitted through ingestion of food or water contaminated with the bacterium Vibrio cholerae. The main source of contamination is poor sanitation where human waste enters drinking water supplies. Contaminated seafood, raw vegetables irrigated with polluted water, and unwashed fruits may also transmit cholera. In communities with poor hygiene practices, cholera spreads rapidly, especially in areas with overcrowding and lack of clean drinking water.

    The symptoms of cholera include sudden onset of watery diarrhea that is often described as "rice-water stools." This leads to rapid dehydration, which may cause intense thirst, sunken eyes, dry mouth, and low blood pressure. In severe cases, muscle cramps, shock, and even death may occur within hours if treatment is not given. Vomiting and general body weakness also accompany the disease.

    One way of controlling cholera is improving sanitation by ensuring proper disposal of human waste to prevent contamination of water sources. This includes building proper toilets and sewage systems. Another control measure is ensuring access to safe and clean drinking water through boiling, chlorination, or filtration. Public health education is also crucial; communities should be educated on personal hygiene such as regular hand washing before meals and after using toilets. Vaccination against cholera can provide temporary protection in areas prone to outbreaks. Prompt treatment of infected individuals using oral rehydration salts and intravenous fluids is essential to reduce mortality and limit the spread of the disease.

13. Explain the importance of providing care and support to people living with HIV/AIDS and the effect of discrimination and stigma toward people with HIV/AIDS in the community, family and at school.

    Providing care and support to people living with HIV/AIDS is important because it helps them manage the disease effectively. Antiretroviral therapy (ART) improves the health of infected individuals by suppressing the virus and boosting their immunity. Access to regular medical care ensures early treatment of opportunistic infections such as tuberculosis and pneumonia, which are common among HIV patients. Proper care prolongs life expectancy and allows people living with HIV/AIDS to live productive lives.

    Support is also essential in reducing the psychological burden associated with the disease. Many people living with HIV/AIDS face stress, depression, and fear of rejection. Counseling and support groups help them cope emotionally and mentally, giving them hope and confidence. Family support provides love and acceptance, which enhances the well-being of the affected individuals and reduces feelings of isolation.

Discrimination and stigma toward people with HIV/AIDS have severe negative effects. In the community, stigma leads to isolation, where infected individuals are rejected and excluded from social activities. This increases their suffering and discourages them from seeking medical help. At the family level, discrimination may cause neglect and lack of care, which worsens the condition of the patient. In schools, stigma affects children living with HIV or those from affected families, leading to bullying, low self-esteem, and poor academic performance.

Fighting stigma is important to encourage openness and acceptance of people living with HIV/AIDS. When stigma is reduced, individuals are more willing to get tested and treated early, which helps in controlling the spread of the virus. Education campaigns that emphasize that HIV/AIDS cannot be spread by casual contact can change attitudes in society. Showing compassion and understanding allows people living with HIV/AIDS to live with dignity, while contributing positively to their families, schools, and communities.