THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
DIPLOMA IN SECONDARY EDUCATTION EXAMINATION

733/2A **BIOLOGY 2A**

(ACTUAL PRACTICAL A)

Time: 3 Hours **ANSWERS** **Tuesday, 13th May 2014**

Instructions.

1. This paper consists of **three (3)** questions.
2. Answer **all** questions
3. Question number 1 carries 40 marks and the rest carry 30 marks.
4. Cellular phones are **note** allowed in the examination room.
5. Write your **examination Number** on every page of your answer booklet(s).

1. Dissect specimen S_1 in the usual way to display the digestive system.

(a) Draw and label the structures only related to the system.

Answer:
Your diagram should show:

- Mouth
- Oesophagus
- Crop
- Gizzard
- Stomach (midgut)
- Intestine
- Anus

(b) State the enzymes secreted by each structure labelled in (a) above.

Answer:

- Salivary glands (in Mouth): Amylase
- Stomach (midgut): Protease, Lipase
- Intestine: Amylase, Maltase, Protease, Lipase

(c) Suggest the substrate digested by each enzyme in (b) above and state its products of digestion.

Answer:

- Amylase: Acts on starch to produce maltose
- Maltase: Acts on maltose to produce glucose
- Protease: Acts on proteins to produce amino acids
- Lipase: Acts on lipids to produce fatty acids and glycerol

(d) State five economic importance of specimen S_1.

Answer:

1. Acts as a decomposer by breaking down organic waste.
2. Serves as food for poultry and fish.
3. Used as bait in fishing.
4. Helps in soil aeration through burrowing.
5. Contributes to nutrient cycling in the environment.

(e) Classify specimen S_1 to the class level.

Answer:
Kingdom: Animalia
Phylum: Arthropoda
Class: Insecta

(f) Name four features shared by both specimen S_1 and man.

Answer:

1. Bilateral symmetry
2. Digestive system with mouth and anus
3. Presence of a circulatory system
4. Presence of sense organs

(g) Leave your dissection properly displayed for assessment.

2. (a) You are provided with solution A_1. Using the reagents provided carry out an experiment to identify food substance(s) contained in solution A_1. Present your report in a tabular form as follows:

FOOD TESTED	PROCEDURE	OBSERVATION	INFERENCE
Starch	Add iodine solution to A_1	Blue-black colour appears	Starch present
Reducing sugar	Add Benedict's solution, heat in water bath	Green/yellow/orange precipitate forms	Reducing sugar present
Protein	Add Biuret solution	Purple colour appears	Protein present
Lipid	Add ethanol, shake, then add water	White emulsion forms	Lipid present

(b) (i) For each of the food substance identified in (a), suggest one storage organ from which solution A_1 might have been extracted.

Answer:

- Starch: Yam tuber
- Reducing sugar: Ripe banana
- Protein: Beans seed
- Lipid: Groundnut seed

(ii) What role is played by each food substance identified in solution A_1 in human being.

Answer:

- Starch: Provides energy after digestion into glucose
- Reducing sugar: Provides quick, readily available energy
- Protein: Builds and repairs body tissues
- Lipid: Long-term energy storage and insulation

(iii) State where and in which form each food substance is stored in the body.

Answer:

- Starch (as glucose → glycogen): Stored in liver and muscles
- Reducing sugar (as glucose): Circulates in blood; excess stored as glycogen
- Protein: Not stored; amino acids used for body protein synthesis
- Lipid: Stored in adipose tissue

(iv) Where does the digestion of each food substance take place.

Answer:

- Starch: Mouth (salivary amylase) and small intestine
- Reducing sugar: Small intestine
- Protein: Stomach and small intestine
- Lipid: Small intestine

(v) Name the enzyme(s) that act on each food substance.

Answer:

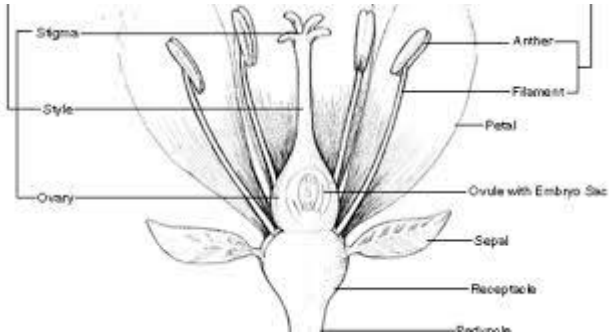
- Starch: Amylase
- Reducing sugar: Maltase
- Protein: Pepsin, Trypsin
- Lipid: Lipase

(vi) One of the food substances identified is important to desert animals. Name the food substance and state why it is said to be important to such group of animals.

Answer:
Food substance: Lipid
Importance: Because its metabolism produces water, which is useful for desert animals that experience water scarcity.

3. (a) You have been provided with a flower (F_1):

(i) Draw the floral diagram of F_1.



(ii) Write the floral formula of F_1.

Answer:
⚥ K(5) C(5) A(5) G(2)

Where:
⚥ = bisexual
K = calyx (sepals)
C = corolla (petals)
A = androecium (stamens)
G = gynoecium (carpels)

(iii) Classify specimen F_1 to class level.

Answer:
Kingdom: Plantae
Phylum: Angiospermophyta
Class: Dicotyledonae

(iv) Write the characteristics of the phylum to which specimen F_1 belong.

Answer:

1. Possess true roots, stems, and leaves.
2. Have vascular tissues (xylem and phloem).
3. Produce flowers for reproduction.
4. Seeds enclosed within a fruit.

(b) Study specimen M provided.

(i) Provide the phylum and class for specimen M.

Answer:
Phylum: Arthropoda
Class: Insecta

(ii) Name the method of feeding used by specimen M.

Answer:
Siphoning

(iii) Describe the mouth parts that allow the above method of feeding possible.

Answer:
It has a long, coiled proboscis adapted for sucking nectar from flowers.

(iv) Cut one of the hind limb of specimen M with the innermost side facing upwards. Draw a large, well labeled diagram of the limb.

Answer:
(Describe: Diagram should show coxa, femur, tibia, tarsus, and claw.)

(v) State how the hind limb of the specimen is adapted to carry out its functions.

Answer:
It is long and slender for efficient walking, with hooks or claws at the end for clinging onto surfaces like leaves and flowers.

(c) Outline the life cycle of specimen F_1.

Answer:

1. Pollination: Transfer of pollen from anther to stigma.
2. Fertilization: Fusion of male and female gametes inside ovary.
3. Seed and fruit formation: Ovary develops into fruit, ovules into seeds.
4. Seed dispersal: Seeds dispersed by wind, animals, or water.
5. Germination: Seed grows into a new plant under suitable conditions.