THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

133/3A **BIOLOGY 3A**

(ACTUAL PRACTICAL A)

(For Both School and Private Candidates)

Time: 2:30 Hours **ANSWERS** **Year: 2024**

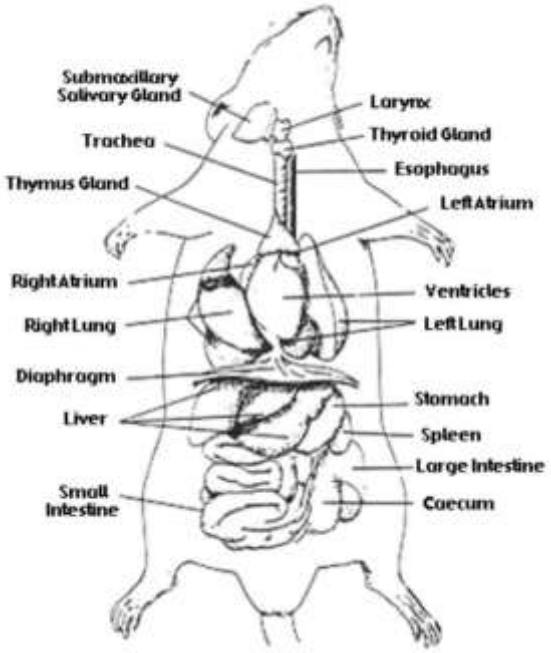
Instructions

1. This paper consists of three questions.

2. Answer all questions.

1. You have been provided with specimen C_1. Dissect the specimen in a usual way and display the digestive system and pin it to your right hand side.

(a) Draw a large, neat diagram of your dissection and label twelve parts.
Leave your dissection properly displayed for assessment.



(b) What are the roles played by digestive parts you have labelled in 1(a)? Give five points.

Mouth – It is responsible for mechanical digestion through chewing and chemical digestion through salivary enzymes.
Stomach – It stores food and secretes gastric juice for breaking down proteins.
Small intestine – Main site of digestion and absorption of nutrients.
Liver – Produces bile which helps in emulsification of fats.
Pancreas – Produces digestive enzymes and bicarbonate to neutralize stomach acid.

2. You have been provided with specimen N.

(a) Observe the specimen carefully then answer the following questions:
(i) What function do the structures constituting the female and male parts play in the specimen?

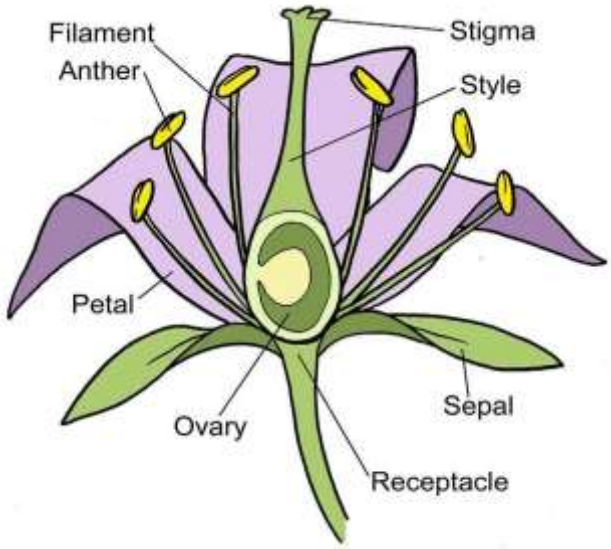
The female parts (carpel/pistil) include stigma, style, and ovary which are involved in receiving pollen and housing ovules for fertilization.
The male parts (stamen) consist of anther and filament, responsible for producing and releasing pollen grains.

(ii) How does the specimen manage to attract insects for pollination?

The specimen attracts insects through bright colored petals, nectar production, scent emission, and in some cases, patterns (nectar guides) that direct insects to the nectar.

(iii) How does fertilization process take place in the specimen?
Fertilization begins when pollen grains land on the stigma, germinate, and grow a pollen tube down the style into the ovary where sperm cells travel to fertilize the ovule, forming a zygote.

(b) Using a scalpel, remove all petals and sepals from the specimen then answer the following questions:
(i) Draw a neat and well labelled diagram of the remaining part of the specimen.



(ii) Which part of the specimen receives the male gametes during pollination?

The stigma receives the male gametes (pollen grains) during pollination.

(iii) How the part responsible for transfer of male gametes to the place where fertilization takes place adapted to its function?

The style is adapted by being long and hollow, allowing the pollen tube to grow through it and deliver sperm cells to the ovary. The stigma is sticky or feathery to capture pollen effectively.

3. You have been provided with specimens R, S and T. Study the specimens and answer the following questions.

(a)
(i) What are the common names of specimens R, S and T?

R – Earthworm

S – Grasshopper
T – Housefly

(ii) Specimens S and T belong to which Class(s)?

S – Insecta
T – Insecta

(iii) Why do specimens R, S and T placed in the Class they belong?

R belongs to class Oligochaeta due to its segmented body, lack of appendages, and presence of setae.
S and T belong to class Insecta because they have three body parts (head, thorax, abdomen), compound eyes, antennae, and three pairs of jointed legs.

(b)(i) Where is the habitat for specimens R and S?

R (Earthworm) – Lives in moist soil and underground burrows.
S (Grasshopper) – Inhabits grassy fields, farms, and shrubs.

(ii) How does specimen S adapted to its habitat?

Specimen S has strong hind legs for jumping, a camouflage body color, tough exoskeleton to reduce water loss, and wings for short-distance flight.

(iii) In what ways do specimens S and T considered useful to human being?

Specimen S (Grasshopper) – Can be a source of food in some cultures and used in biological research.
Specimen T (Housefly) – Though often considered a pest, it plays a role in decomposition by feeding on waste and can be used in forensic investigations.