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: 1997**

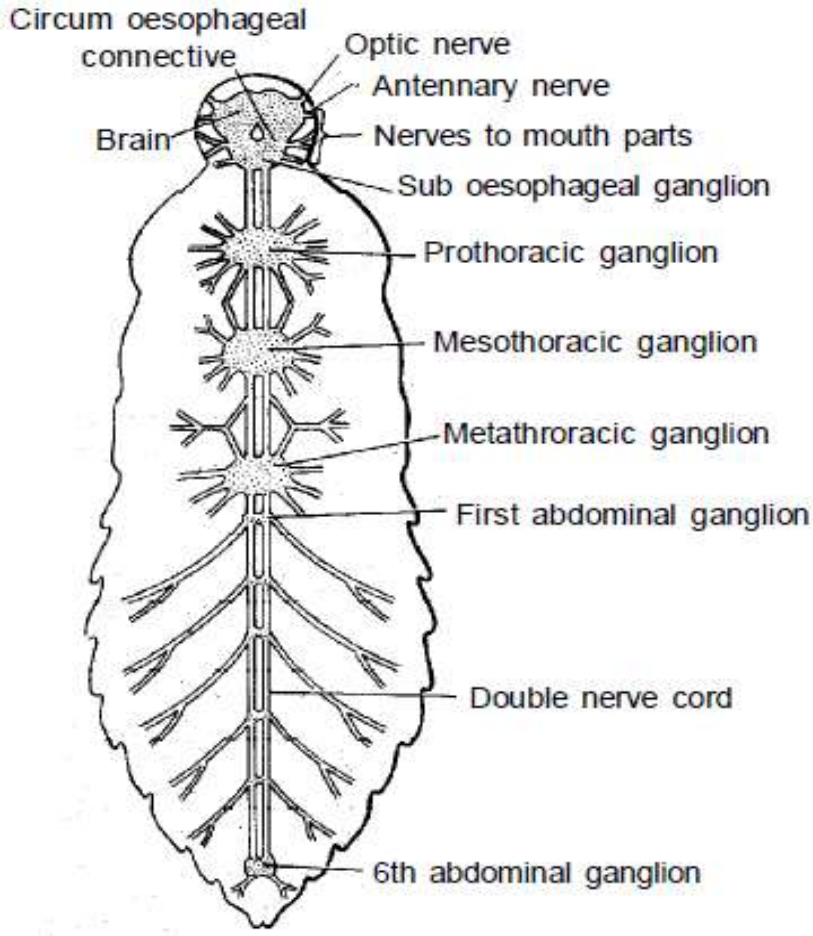
Instructions

1. This paper consists of three questions.

2. Answer all questions.

1.Dissect specimen S_1 in the usual way to fully display the spinal nerves and the sympathetic nervous system.

(a) Make a large and neat drawing of your dissection.



(b) Label on your drawing the following:
- Hypoglossal nerve
- Branchial nerve
- Sympathetic cord
- Sympathetic ganglion
- Ramus communicans
- Spinal nerves 7, 8, 9 & 10
- Sciatic plexus
- Sciatic nerve

(c) LEAVE YOUR DISSECTION PROPERLY DISPLAYED FOR ASSESSMENT.

2. You are provided with specimens S_2 and S_3, each in powder and solution forms. S_2 and S_3 were obtained from unfermented and germinated grains of finger millet respectively.

(a)

Specimen	Food substance tested	Procedure	Observation	Inference
S_2	Starch	Add iodine	Blue-black colour	Starch present
S_3	Maltose	Add Benedict's solution and boil	Brick-red precipitate	Reducing sugar present

(b)

(i) Name the biochemical process by which the type of carbohydrate in S_2 was converted to the type in S_3.

Germination (starch hydrolysis)

(ii) Write a word equation to represent the biochemical process:

Starch + Water -----> Maltose

(iii) What is the biological significance of this process in living organisms?

Provides energy in usable form for growth and development during germination

3. Study specimen S_4 carefully.

(a) (i) Detach one young fern leaf and observe with hand lens. Draw and label.

Labels:

- Leaflet (pinnae)
- Rachis
- Petiole
- Midrib
- Sori (if present)

(ii) What phase of the life cycle does specimen S_4 represent?

Sporophyte stage

(b) Classify the specimen up to class level and give one observable feature for each rank:

Rank	Classification	Observable Feature
Kingdom	Plantae	Green in color, photosynthetic
Division	Pteridophyta	Has vascular tissue, lacks flowers
Class	Filicopsida	Sori on the underside of fronds

4. (a) Carefully study the external features of the six animals labeled A – F using a hand lens. Use the key to identify them.

1a. Wings -----> go to 2
2a. Abdomen with cerci -----> go to 3
3a. Three distinct body divisions -----> go to 4
4a. Antenna present -----> A

1b. No wings -----> go to 3
3b. Two body divisions -----> go to 5
5b. Walking legs 2 pairs per body somite -----> F

(b) Give common names for specimens A – F.
A -----> Grasshopper
B -----> Butterfly
C -----> Wasp
D -----> Millipede
E -----> Spider
F -----> Centipede

(c) Classify specimen C:
Phylum -----> Arthropoda
Class -----> Insecta
Order -----> Hymenoptera

(d) Name the respiratory organs for specimens A and E.
A (Grasshopper) -----> Spiracles and tracheae
E (Spider) -----> Book lungs