

THE UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE,
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
NJOMBE REGION



FORM SIX PRE – NATIONAL EXAMINATION

CODE: 133/2

BIOLOGY 2

(For Both School and Private Candidates)

TIME: 03: 00 HOURS

FRIDAY, 15TH March 2024 P.M

INSTRUCTIONS

1. This paper consists of **six (6)** questions.
2. Answer **five (5)** questions
3. Each question carries **twenty (20)** marks
4. Except for diagrams that must be drawn in pencil, all writing should be in blue or black ink
5. Write your Examination number on every page of your answer booklet (s)

1. a) Figure 1 presents the simplified life cycle of a malaria causative organism. Study it and answer the associated questions.

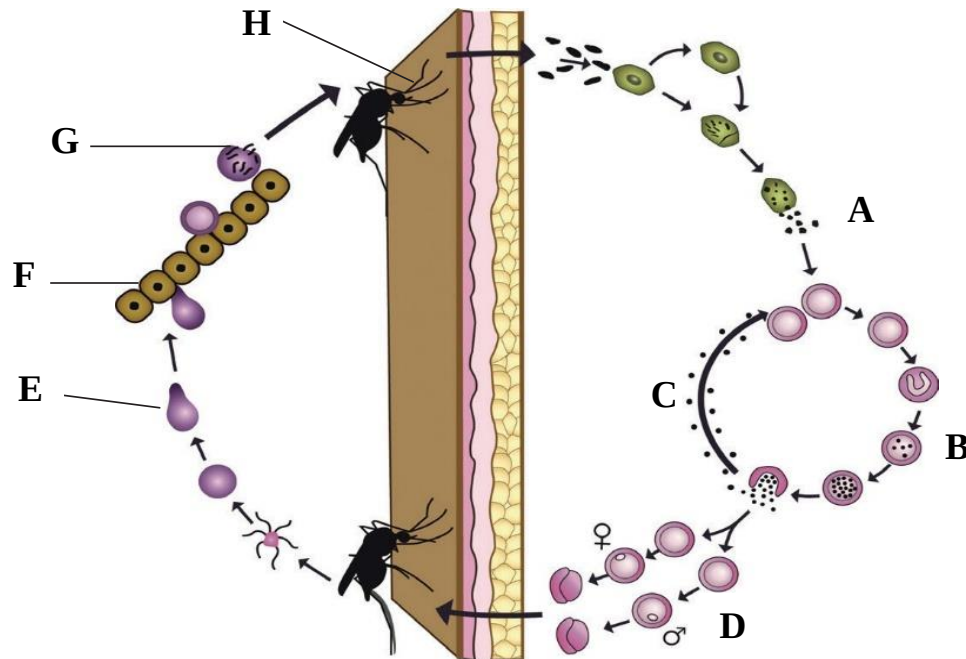


Figure 1

- i. Identify and classify the organism to phylum/division level
 - ii. Name the structures/processes presented by letters A to H
 - iii. In what ways is the organism adapted to its mode of life?
- b) i) With an example in each, state the classes of the phylum to which *Taenia solium* belongs.
 - ii) Giving five reasons, support the statement that Reptiles possess unique features which differentiate them from other chordates.
- a) Briefly explain what is meant by the following terminologies as used in organic evolution:
 - i. Micro-evolution
 - ii. Genetic drift
 - iii. Disruptive natural selection
 - iv. Adaptive radiation
 - b) Explain the Lamarck's theory of organic evolution and explain why almost all modern biologists reject the theory.
- a) Briefly explain the mechanisms through which biotic components of the ecosystem determine survival and distribution of living organisms.
 - b) Explain how quadrat can be used to estimate population size with respect to three aspects of species distribution namely:
 - i. Species density
 - ii. Species frequency
 - iii. Species cover

4. a) Briefly explain how each of the following is brought about:
- Epistasis
 - Aneuploidy
 - Turner's syndrome
 - Klinefelter's syndrome
 - Down's syndrome
- b) i) Explain using appropriate genetic symbols, the possible blood groups of children whose parents are both heterozygous, the father being blood group A and the mother B.
- ii) If these parents have non-identical twins, what is the probability that both twins will have blood group A?
5. a) Explain the major biological reason behind the following arguments:
- The interphase stage is considered as the most active stage of cell cycle
 - Mitosis is regarded as an equational division
 - The human thymus gland grows at a higher rate compared to the rest of the body parts during infancy.
 - The growth curve of a perennial plant consists of cumulative series of sigmoid curves.
- b) With the aid of a well-illustrated curve, briefly explain the phases of human growth.
6. a) Kidneys are multifunctional organs, briefly explain any five (05) core functions of kidneys
- b) During urine formation, about 80% of selective reabsorption takes place in the proximal convoluted tubule. State five ways in which the proximal convoluted tubule is adapted for such an activity.