KISII UNIVERSITY

UNIVERSITY EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF BACHELOR OF SCIENCE IN BIOTECHNOLOGY
FIRST SEMESTER 2022/2023
[SEPTEMBER-DECEMBER, 2022]

BIOC 315: PARASITE BIOCHEMISTRY AND PHYSIOLOGY

STREAM: Y3S1 **TIME: 2 HOURS**

DAY: MONDAY, 3:00 – 5:00 PM **DATE: 19/12/2022**

INSTRUCTIONS

1. ***Do not write anything on this question paper.***
2. ***Answer ALL questions in section A and any other TWO in section B.***

SECTION A (40 marks)

Answer ALL questions in this section

1. Explain briefly the mechanism of locating hosts by digenea parasites. Cite specific physiological parameters involved (5 marks)

2. Citing parasite environment and life cycles, justify the complexity of parasite biochemistry (5 marks)

3. Suggest the roles of the following enzymes during malate dismutation in helminth parasites (5 marks)
   i. Malate dehydrogenase (MDH)
   ii. Fumarate hydratase
   iii. Fumarate reductase
   iv. Phosphoenol pyruvate carboxykinase (PEPCK)
   v. Malic enzyme (ME)

4. Elucidate on the features that characterize electron transport in parasitic helminthes. (5 marks)

5. Describe the functions and significance of heat shock proteins (HSP) in parasites (5 marks)

6. Using schistosome cerceriae, describe the mechanism of host entry with specific mention of eicosanoids. (5 marks)

7. State and explain the role of bile salts in parasite establishment. (5 marks)

8. Elucidate on the physiological transformation of digenean cerceriae after skin penetration. (5 marks)

SECTION B (30 marks)

Answer any TWO questions in this section

9. Describe in details physiological stages of parasites that enhance their survival outside the host and subsequent transmission. Cite relevant examples. (15 marks)

10. a) Explain the effects of optimal experimental conditions on hatching and excystation of protozoa and digenea parasites. (8 marks)

b) Describe the different energy stores in parasitic helminthes and protozoa. (7 marks)

11. a) Discuss physiological significance of hypobiosis in parasites. (7 marks)

b) Describe the process of homolactate fermentation as a component of energy metabolism in helminths. (8 marks)