

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN PHYSICS AND BACHELOR OF EDUCATION SCIENCE

PHYS 326: PHYSICS PRACTICAL VI

STREAMS:

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 19/4/2023

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS:

Attempt all questions

This paper consists of three questions. Each question is 20 marks

QUESTION 1 (20 marks)

Logic gates are made using semiconductor devices. Using circuit diagram and logic symbols describe the operations of: NOT, AND, OR, NAND and NOR gates giving their truth tables.

QUESTION 2 (20 MARKS)

- a) Using Young's Double slit experiment, describe quantitatively using appropriate equations the conditions for constructive and destructive interference. (10 marks)
- b) A third-year physics student at Chuka University was to carry out an experiment using a planoconvex lens and a flat glass surface.
 - i) Name the experiment being performed. (1 mark)
 - ii) Describe how the student carried out the experiment (5 marks)
 - iii) What were the expected results. (2 marks)
 - iv) Use appropriate equations to discuss the results obtained. (2 marks)

QUESTION 3 (20 marks)

- a) It is well known that when an electron moves in an applied magnetic field it experiences a force acting normal to both directions and moves in response to this force. Show that the force experienced is given as $F = qvB\sin\theta$. (8 marks)
- b) The wire segment abcd is at the side of a cube. Each side of the cube is 10cm. If the wire is placed in a uniform magnetic field of 0.5T, Calculate:
- i) The magnetic force on section ab. (3 marks)
 - ii) The magnetic force on bc (3 marks)
- c) A third year student wanted to determine the thermal conductivity of a cardboard by Lee's method. Outline the procedure the student would follow. (6 marks)

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