ELIZADE UNIVERSITY

ILARA-MOKIN

ONDO STATE

FACULTY: Basic and Applied Sciences
DEPARTMENT: Physical and Chemical Sciences
FIRST SEMESTER EXAMINATIONS
2018/2019 ACADEMIC SESSION

COURSE CODE: PHY 201

COURSE TITLE: Elementary Modern Physics

DURATION: 2 HOURS

HOD's SIGNATURE

TOTAL MARKS:

Matriculation Number: _____

INSTRUCTIONS:

1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 2 pages with printing on both sides.
3. Answer all questions in the examination booklet provided.
4. More marks are awarded for problem solving method used to solving problems than for the final numerical answer.
5. Box your final answers.
6. **Attempt any 4 of the 5 questions**

QUESTION ONE

(a) State two postulates of Einstein special relativity?

(b) Differentiate between Lorentz transformation and Galilean transformation of Newtonian physics.

(c) Describe the two consequences of Lorentz transformation?

QUESTION TWO

(a) Explain the following: proper frame, proper length, and proper time.

(b) A light pulse is emitted at the origin of a frame of reference, S' at time t'=0. Its distance x' from the origin after a time t' is given by $x'^2 = c^2t^2$. Use the Lorentz transformation to transform this equation to an equation in x and t and show that this is $x^2 = c^2t^2$. Discuss the implication of this result.

QUESTION THREE

(a) What is relativistic velocity?

(b) Calculate the length and the orientation of a rod of length 8m in a frame of reference which is moving with a velocity equal to 0.8c, in a direction making an angle of 45^0 with the rod.

QUESTION FOUR

(a) Explain Planck's law of blackbody radiation and Wien's displacement law?

(b) Explain the uncertainty principle by Heisenberg?

QUESTION FIVE

(a) What is time independent Schrödinger equation?

(b) Explain briefly the Behr's theory of atomic structure to include his model?