## PREFACE

Alhamdulillahi rabbil 'alamiin, Praise be to Allah subhanahu wa ta'ala, the God of the universe, the owner and creator of all that is in the heavens and on earth and between them. Alhamdulillah, thanks to the grace and ease of Allah subhanahu wa ta'ala, finally the author can complete the thesis as one of the academic requirements in order to obtain a bachelor's degree in the Bilingual Physics Education Study Program, Faculty of Mathematics and Sciences, State University of Medan.

The preparation of this thesis is inseparable from various obstacles, but thanks to the help, guidance and prayers of various parties so that the author can complete this thesis. Therefore, the author would like to thank:

- 1. Mr. Prof. Dr. Baharuddin, ST., M.Pd, as the Rector of Medan State University for the opportunity given to the author to attend undergraduate education at State University of Medan.
- 2. Mrs. Dr. Ani Sutiani, M.Si, as the Dean of the Faculty of Mathematics and Sciences, State University of Medan.
- 3. Mr. Dr. Jamalum Purba, M.Si as Vice Dean for Academic Affairs, Mrs. Dr. Dewi Wulandari, S.Si., M.Si as Vice Dean for Finance and Personnel, and Mr. Dr. Rahmatsyah, M.Si as Vice Dean for Student Affairs of the Faculty of Mathematics and Sciences, State University of Medan.
- Mrs. Dr. Yuni Warty, M.Si as the Head of Physics Department and Mrs. Dr. Ely Djulia, M.Pd as the Bilingual Program Coordinator.
- 5. Mrs. Prof. Dr. Derlina, M.Si as Academic Supervisor who has provided good academic guidance to the author during the implementation of lectures at Medan State University.
- 6. Mrs. Dr. Rita Juliani, M.Si as Thesis Supervisor who has guided and provided direction, motivation, input, and extraordinary support to the author during the research and writing of this thesis.

- Mr. Prof. Drs. Togi Tampubolon, M.Si., Ph.D, Mr. Prof. Dr. Sahyar, M.S., M.M and Mrs. Dr. Dewi Wulandari, M.Si as examiners who have provided advice and direction to the author so that he can complete this thesis.
- Mr. Juniar Hutahaean, M.Si, Mr. Muhammad Kadri, S.Si., M.Sc and Mr. Luqmanul Hakim, S.Pd as expert lecturers validating the Material, Construction and Language of the test instrument in this thesis.
- All lecturers of the Physics Department who have provided teaching and guidance during the lectures at the Faculty of Mathematics and Sciences, State University of Medan.
- 10. Mr. Awaluddin, S.Pd.I as the Head of SMA Swasta PAB-8 Saentis Percut Sei Tuan, Mrs. Sri Susanti, S.Pd as a physics teacher who has been kindly helping the author during the implementation of research and data collection for thesis writing.
- 11. Infinite thanks that cannot be counted by numbers, cannot be painted by colors and cannot be uttered by words to my beloved parents Mr. Suryo Sastro Wicaksono and Mrs. Sri Handayani who have cared for and educated the author with extraordinary patience and provided prayer assistance, attention, affection, motivation, and support both morally and materially, so that finally I can complete the lecture until completing this thesis well.
- 12. The author expresses his most special and dear thanks to his parents, Mr. Suryo Sastro Wicaksono and Mrs. Sri Handayani who have cared for and educated the author with extraordinary patience and provided prayer assistance, attention, affection, motivation, and support both morally and materially, so that finally he can complete the lecture until completing this thesis well.
- 13. My younger siblings, Arif Subarkah Perangin-angin and Erlyta Fayola Prinst who always provide prayers, enthusiasm and irreplaceable support during the completion of this thesis.
- 14. Grandfather, grandmother, and family in Klaten who always encourage, support, and pray for the author so that this thesis can be completed properly.

- 15. Eri Santi who has accompanied and helped the author from the beginning of college, preparing proposals until the author completes this thesis.
- Siti Aisyah who always gave support, encouragement, and prayers until this thesis was completed.
- 17. Other parties that the author cannot mention one by one who helped the author in completing this thesis.

Medan, April 18th 2024

Silvania Carella Prinst IDN.4173121050