



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

**UNIVERSITY EXAMINATIONS FOR THE DIPLOMA IN MARINE ENGINEERING
(TVET)**

1ST YEAR 2ND SEMESTER 2023/2024 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TDM 2124

COURSE TITLE: THERMODYNAMICS PRINCIPLES

EXAM VENUE: STREAM: Dip Marine Eng

DATE: ../04/2024 EXAM SESSION:

DURATION: 2 HOURS

Instructions

- 1. Answer question 1 (Compulsory) in Section A and ANY other three questions in Section B**
- 2. Candidates are advised not to write on question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

SECTION A

QUESTION ONE (COMPULSORY) (40 Marks)

- a. What is thermodynamics? (2 Marks)
- b. In relation to thermodynamics principle explain the following; (14 Marks)
- i. Substance
 - ii. System
 - iii. Boundary and surrounding
 - iv. Process
 - v. Cycle and path
 - vi. Work
 - vii. Heat
- c. State eight sources of renewable energy. (8 Marks)
- d. Explain the working fluid in the phases of thermodynamics. (4 Marks)
- e. State first and second law of thermodynamics. (4 Marks)
- f. State three applications areas of thermodynamics. (8 Marks)

SECTION B

ANSWER ANY THREE QUESTIONS (60 Marks)

2. With an aid of a well diagram explain an open or close system of power plant. (20 Marks)
3. Explain tidal power, its benefits and challenges in relation to marine engineering work. (20 Marks)
4. a) State and explain the working fluid according to phases of pure substance in thermodynamics. (10 Marks)
- b) Develop the p.v diagram explaining; (10 Marks)
- i) Liquid line
 - ii) Vapor line
 - iii) Combined line

5. With aid of a diagram, explain the P.T diagram for a pure substance

(20 Marks)