



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

DIPLOMA IN MARINE ENGINEERING (DMAE 6)

EMR 2314 MOTOR AND STEAM ENGINEERING KNOWLEDGE II

END OF SEMESTER EXAMINATIONS

YEAR 3 SEMESTER 2

SERIES: DECEMBER, 2013

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. You should have the following for this examination:
 - Answer Booklet
 - Non-programmable Scientific Calculator
2. This paper consists of **FIVE** Questions.
3. Answer **ANY THREE** Questions.
4. All Questions carry equal marks.
5. **This paper consists of THREE printed pages.**

Question ONE

- (a) Express work done in a steam plant in terms of:
- (i) Pressure, P
 - (ii) Volumes, V
- (8 marks)**
- (b) With the aid of a diagram, explain the function of each component of a steam plant.
- (12 marks)**

Question TWO

- (a) A marine diesel engine is fitted with certain safety devices. List and explain the purpose of any **SEVEN** safety devices.
- (7 marks)**
- (b) When the engine is running at sea, a number of items must be checked continually in line with the ISM certification requirements. Describe any **EIGHT** of these items.
- (8 marks)**
- (c) Briefly describe the term “condition monitoring” in a marine engineering environment.
- (5 marks)**

Question THREE

- (a) State the First Law of Thermodynamics.
- (4 marks)**
- (b) Define the term “Energy”.
- (2 marks)**
- (c) Explain the following terms; giving at least TWO examples in each case:
- (i) Stored energy
 - (ii) Transitional energy
- (6 marks)**
- (d) Explain the difference between an Air compressor and a Gas turbine.
- (8 marks)**

Question FOUR

- (a) With the aid of a diagram(s), explain an engine mechanism and show the relationship between Pressure, (P); Volume (V) and Temperature (T).
- (14 marks)**
- (b) Explain the meaning of the following terms:

- (i) Internal Combustion Engine
- (ii) External Combustion Engine

(6 marks)

Question FIVE

With the aid of diagrams, explain the difference between a four-stroke and a two-stroke engine, giving a step by step account of the operation of each case. **(20 marks)**