TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA MARINE ENGINEERING

EMR 2109: MARINE ENGINEERING KNOWLEDGE I.

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: SUPP 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt any THREE questions.

Do not write on the question paper.

PAPER TWO

QUESTION ONE

(a) (i) Explain the working principle of a two-stroke engine

(ii)State TWO advantages and TWO disadvantages of the two stroke engine over the four stroke engine

[9Marks]

(b) (i) List SIX functional componets of a diesel plant and explain their respective functions.

(ii) State TWO uses of a diesel Plant aboard a ship.

[11Marks]

QUESTION TWO

(a) (i) Define the term solid lubrication.

(ii)State FOUR factor to consider when selecting the suitability of a material for used as a solid lubricant.

[6Marks]

(b) (i) State the functions of lubricant additive.

(ii) Explain the effects of the following on a lubricant

I. Air

II. Water

III. Temperature

[9Marks]

(c)Describe TWO methods of lubrication used aboard ship.

[5Marks]

QUESTION THREE

(a)Describe the working principle of a surface condenser.

[5Marks]

(b) (i) List THREE advantages of surface condensers.

(ii) Outline the steps removal of scales on a surface condenser.

[9Marks]

(b) Explain with the aid of a diagram the operation of a fuel purifier.

[6Marks]

QUESTION FOUR

(a) Explain the following properties of fuels.

(i) Octane Number

(ii)Cetane Number

[4Marks]

(b) Describe how the Orsat apparatus may be used to anaylse the dry products of combustion by volume.

[8marks]

(c) The Orsat apparatus gave an analysis by volume of the products from a furnace to be CO_2 8.7%, 0_2 5.5%, CO 6.3 %, N_2 79.8%.

Calculate the percentage analysis by mass of the dry products of combustion.

[8Marks]

QUESTION FIVE

(a) (i)State THREE ways in which pumps increase the static pressure of funds.

(ii) State THREE factors that affect the performance of a pump.

[6Marks]

(b)Explain FOUR routine inspections to be carried out on hourly basis to prevent costly shut downs of pumps aboard a ship

[6Marks]

(c)Describe the maintenance to be carried out on valves to ensure that they do not jam.

[4Marks]

(d) Describe the process of priming a centrifugal pump.

[4Marks]