



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN MECHANICAL ENGINEERING (PLANT OPTION) TVET

2502/105: PLANT MAINTENANCE

DATE: 15/4/2019

TIME: 8.30-11.30 AM

INSTRUCTIONS:

This paper consists of five questions, attempt ALL .

QUESTION ONE (20 MARKS)

- a) Explain the need of lubrication. (5 marks)
- b) Using neat sketches illustrate the following lubrication methods;
 - i. Hydrodynamic
 - ii. Aerodynamic
 - iii. Boundary
 - iv. Solid film (10 marks)
- c) Mention Five desirable properties of good lubricant. (5 marks)

QUESTION TWO (20 MARKS)

- a) Using neat diagram show constructional features of reciprocating air compressor and explain briefly the working principle. (10 marks)
- b) Differentiate between reciprocating and centrifugal air compressors citing typical areas of application for each. (10 marks)

QUESTION THREE (20 MARKS)

- a) Describe Four methods of capacity control in air compressors (8 marks)
- b) Mention Five factors to consider when selecting an air compressor for particular application. (5 marks)
- c) Illustrate a typical compressed air distribution pipe layout plant showing exact location of the following equipment; (7 marks)
 - i. Regulator
 - ii. Strainer
 - iii. Separator
 - iv. Lubricator
 - v. Drain cork.

QUESTION FOUR (20 MARKS)

- a) Describe the following hydraulic principles. (6 marks)
 - i. Hydrostatic
 - ii. Hydrodynamic
 - iii. Hydrokinetic
- b) Discuss briefly the following hydraulic systems;
 - i. Hydraulic accumulator (8 marks)
 - ii. Torque converters
- c) Give Six maintenance checks can be done on hydraulic systems. (6 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss briefly classification of pumps. (6 marks)
- b) Describe construction of a centrifugal pump giving areas of application. (8 marks)
- c) Explain why centrifugal pumps are widely used in most typical applications. (6 marks)