



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

DIPLOMA IN MECHANICAL ENGINEERING

MED-PR 305: ENGINEERING DESIGN 1

DATE: 25/7/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Answer Question One (Compulsory) and Any Other Two Questions

1.
 - a) Define the term engineering design. (4 marks)
 - b) With the aid of a flow diagram explain the stages involved in the design of an engineering product. (16 marks)
 - c) Explain what happens in the analysis stage of a design. (6 marks)
 - d) Describe any new improvement on the modern car from the earlier models with regard to the ergonomics. (4 marks)
2.
 - a) Describe Five mechanisms used in actuation of various mechanical movements. (10 marks)
 - b) State THREE types of common hazards associated with working on machinery. (10 marks)
3.
 - a) Explain the Fail-Safe design of machines. (6 marks)
 - b) Sketch Four types of screw thread forms and State one application for each. (12 marks)
 - c) State the advantages of lubrication in mechanisms. (2 marks)

4. a) Design a simple machine for (a) pumping water to a tank 5m above it's level;. (10 marks)
- b) Extracting juice from mangoes. (10 marks)
5. a) State FIVE reasons that may necessitate re-designing of an engineering product. (10 marks)
- b) Explain what is meant by the term ergonomics. (4 marks)
- c) Using a neat sketch, describe an ergonomic control loop for working on a chaff cutter. (6 marks)