



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

2704/104WT: WORKSHOP TECHNOLOGY 1

DATE: 17/12/2020

TIME: 2:30 – 5:30 PM

INSTRUCTIONS TO CANDIDATES

Answer all questions

All questions carry equal marks

1.
 - (a) State five safety precautions relating to power hand tools. (5 marks)
 - (b) Highlight four precautions considered when lifting heavy objects in a workshop. (4 marks)
 - (c) Explain each of the following terms related to pumps:
 - i. static discharge head;
 - ii. self-priming;
 - iii. volumetric flow (6 marks)
 - (d) Calculate the energy required in kilowatt to operate a pump using:

Unit weight of water	9.8 kN/m ³
Total pumping head including friction	5 m
Efficiency	80%
Discharge	20 m/s

(5 marks)
2.
 - (a) With the aid of a labeled sketch explain the operation of a four-cycle engine. (14 marks)
 - (b) Outline two tools for each of the following tasks:
 - i. measuring;
 - ii. holding;
 - iii. testing. (6 marks)

3. (a) Explain the operation of each of the following fire extinguishers:
- i. foam extinguishers.
 - ii. dry powder extinguishers;
 - iii. CO2 extinguishers;
 - iv. wet chemical extinguishers; (8 marks)
- (b) Sketch and label each of the following tools:
- i. adjustable spanner;
 - ii. side cutting plier;
 - iii. hand vice. (12 marks)
4. (a) With the aid of labeled sketch, describe a horizontal milling machine. (8 marks)
- (b) Explain the function of each of the following parts of a lathe machine:
- i. head stock;
 - ii. lead screw;
 - iii. carriage;
 - iv. spindle. (8 marks)
- (c) Differentiate the operation of diesel engine from petrol engine. (4 marks)
5. (a) Explain any **Five** common milling machine operations. (10 marks)
- (b) Explain any **Five** common lathe machine operations. (10 marks)

