



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING
FIRST YEAR FIRST SEMESTER EXAMINATION FOR
DIPLOMA IN MECHANICAL ENGINEERING
ENGINEERING DRAWING AND DESIGN 1

DATE: 7/9/2021

TIME: 8:30 – 11:30 AM

INSTRUCTIONS:

Instructions to Candidates

Answer ALL Questions.

You need drawing papers size A3.

1. (a) Define the terms: base circle, pitch point and pressure angle with respect to gears. (6 marks)
 (b) Construct a part-involute to a 70 degree sector of a base circle of radius 140mm. (14.marks)
2. (a) Construct a full involute to a base circle of diameter 80 mm. (10 marks)
 (b) Describe the characteristics of the helical gears and explain why they are sometimes preferred to spur gears in mechanical drivers. (5 marks)
 (c) Sketch a spur gear and label its Six elements. (5 marks)
3. (a) Explain FOUR material properties for plain bearings. (8 marks)
 (b) Sketch and explain the following bearings:
 (i) Cylindrical roller.
 (ii) Self aligning ball bearing.
 .. (iii) Ball thrust bearing
 (iv) Rigid ball journal bearing. (12 marks)

4. (a) Sketch and describe Four thread forms used in mechanical drivers. (12 marks)
- (b) Define the term mechanism. (2 marks)
- (c) Using sketches describe any Two types of cams used in mechanical engineering. (6 marks)
5. Make FREEHAND sketches of each of the following:
- (i) Car tyre
 - (ii) Vernier Height gauge.
 - (iii) Anvil. (20 marks)