



MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN MECHANICAL ENGINEERING

MED-PR 215: PRODUCTION TECHNOLOGY II

DATE:30/5/2017

TIME: 8.30-10.30 AM

INSTRUCTIONS

- This Paper Contains Two sections A and B.
- Section A is compulsory
- Attempt any other Two questions from section B.

SECTION A (COMPULSORY) - 30 MARKS.

1.
 - a) State any **Five** areas of application for gears. (5 marks)
 - b) State any **Three** materials used in the manufacture of gears. (3 marks)
 - c) Describe any **Five** factors which need to be considered in the selection of gear materials. (10 marks)
 - d) Describe the following methods of manufacturing gears.
 - i. Casting
 - ii. Metal removal
 - iii. Metal forming (12 marks)

SECTION B (ATTEMPT ANY TWO QUESTIONS FROM THIS SECTION)

2. Describe any **Five** gear finishing operations. (20 marks)
3. Describe the following surface finishing processes.

- i. Super finishing
 - ii. Grinding
 - iii. Lapping
 - iv. Polishing
 - v. Honing (20 marks)
4. a) Differentiate between cutting and forming operations as used in press work. (4 marks)
- b) Define the following terms as used in press work.
- i. Blanking
 - ii. Punching
 - iii. Drawing
 - iv. Squeezing (8 marks)
- c) In the design of press tools certain requirements have to be met. List any **Five** of them. (5 marks)
- d) State any **Three** advantages of hydraulic presses over mechanical presses. (3 marks)
5. a) Define the following terminologies in press work.
- i. Bed
 - ii. Punch plate
 - iii. Stroke
 - iv. Punch
 - v. Bolster plate (10 marks)
- b) Define the term '**Spring back**' and explain how allowances are made to compensate for its harmful effects. (4 marks)
- c) Estimate the blanking force to cut a blank 25mm wide and 30mm long from a 1.5mm thick metal strip, if the ultimate shear stress of the material is 450N/mm^2 . Also determine the work done if the percentage penetration is 25 percent of the material thickness. (6 marks)