MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

THIRD YEAR FIRST SEMESTER EXAMINATION FOR DIPLOMA IN MECHANICAL ENGINEERING (PRODUCTION OPTION)

MED-PR: PRODUCTION TECHNOLOGY III

DATE: 3/8/2017 **TIME: 8:30 – 10:30 AM**

INSTRUCTIONS

This Examination contains two sections A and B
- Section A (QUESTION 1) is compulsory
- Attempt any two other questions from Section B

SECTION A (COMPULSORSORY) 30 MARKS

1. a) Define the following terms as applied to automation
   - i CAM
   - ii Monitor
   - iii Assembler
   - iv Debugger
   - v Utility (10 marks)

   b) Describe any five stages of programme development in computer aided manufacturing (CAM). (10 marks)

   c) Explain the advantages of NC system and disadvantages of NC technology over conventional machines. (10 marks)

SECTION B: ANSWER AY TWO QUESTIONS FROM THIS SECTION

2. With the aid of diagrams explain the following as applied to classification of NC machines.

   a) Point – to – point NC (7 marks)

b) Straight cut/axial cut NC (7 marks)

c) Contour cutting NC/continuous path NC (6 marks)

3. a) Illustrate the following types of robots;

i Cylindrical

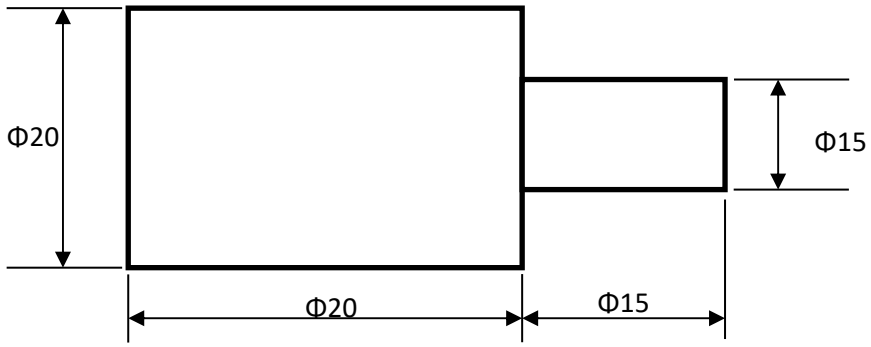
ii Spherical

iii SCARA (15 marks)

b) Explain the lead through method of robot programming. (5 marks)

4. Explain the FIVE basic features of CNC system. (20 marks)

5. a) From a shaft 25mm diameter, make a stepped shaft with dimensions as shown in the figure below. (Take speed = 3000rpm and feed = 30mm/min) (10 marks)



b) With the aid of diagrams explain the following coordinate systems;

i. Absolute coordinate system fixed origin

ii. Incremental coordinate system (10 marks)