



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations for 2015/2016

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

FIRST SEMESTER EXAMINATION FOR DIPLOMA IN MECHANICAL
ENGINEERING

ENGINEERING DRAWING III

DATE: 9/8/2016

TIME: 2:00 – 4:00 pm

INSTRUCTIONS:

Answer all questions in Section A and any other TWO questions in Section B

SECTION A COMPULSORY

1. Figure 1 shows the adjusting unit of a body (1), a handle (2), a pivot (3), a screw (4), a collar (5), and a pin (6). Draw the following views of a completely assembled adjusting unit:
 - a) A front view in the direction of the arrow B, including all hidden details;
 - b) A sectional end view on the cutting plane AA.

Include the main functional dimensions that have a bearing in the assembly. Insert a title block with the necessary information and a part list with the corresponding reference balloons and suggest suitable materials. (30 marks)

SECTION B: SELECT ANY TWO QUESTION

2. a) using sectional elevation and plan only, illustrate the following riveted joints:-
 - (i) Double – row zig-zag lap joints
 - (ii) Double strap butt

(6 marks)

- b) Using simple assemblies, show the applications of
- Hexagonal bolt and nut
 - Stud and nut
 - Socket-head cap screw
 - Grub screw
- (8 marks)
- c) Sketch the following thread profiles, giving their essential angles:-
- Buttress
 - Acme
 - I.S.O.
- (6 marks)
3. a) Giving appropriate examples, discuss the difference between temporary and permanent fastening devices. (4 marks)
- b) Sketch a simple assembly showing the practical application of each of the following mechanical devices.
- Circlip
 - Gib head key
 - Split cotter pin
 - Tap washer
- (8 marks)
- c) Illustrate the use of the following in the mechanical locking arrangement.
- Locking plate
 - Wire lock
 - Spring washer
 - lock nut
- (8 marks)
4. A two start square threaded screw has an outside diameter of 100mm and a pitch of 40mm. Draw an accurately projected elevation of a 120mm length of the screw. (20 marks)
5. A left hand helical spring is made from a steel bar having a square cross section with sides 13mm. The outside diameter of the spring is 104 mm and the pitch of the coils is 51 mm. Draw three coils of the spring, showing clearly the construction employed. Hidden detail is not required. (20 marks)