



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE (MECHANICAL ENGINEERING)

EMM 101: ENGINEERING DRAWING AND DESIGN II

DATE: TUESDAY, 10TH APRIL 2012

TIME: 2.00 P.M. – 4.00 P.M.

INSTRUCTIONS

- i. This paper contains FIVE (5) questions
- ii. You are required to answer THREE (3) questions only
- iii. Question ONE is compulsory
- iv. Attempt any other two questions
- v. Question one carries 30 marks and the other carry 20 marks each
- vi. Construction lines should be faint and should not be erased.
- vii. All dimensions are in millimeters unless otherwise stated.
- viii. Missing and mismatching dimensions, if any, may be suitably assumed

QUESTION ONE (COMPULSORY) (30 MARKS)

Figure 1 shows six parts of a belt pulley unit, a pulley bracket, a pulley, two bushes, a fitted bolt, a nut and a flat washer drawn in first angle orthographic projection. Draw full size in first angle projection the following views:

- i. front view of the Pulley unit assembly. [10 Marks]
- ii. sectional end view on the vertical cutting plane A-A. [5 Marks]
- iii. plan view. [5 Marks]
- Insert a parts list showing all the components. [7 Marks]
- Insert a suitable title block [3 Marks]

QUESTION TWO (20 MARKS)

Figure 2 shows a pictorial view of a bearing bracket. Draw in First angle orthographic projection the following:

- i. sectional front view in direction A-A. [10 Marks]
- ii. end view. [3 Marks]
- iii. plan view. [3 Marks]
- iv. projection symbol according to ISO drawing convention. [2 Marks]
- Insert at least five leading dimensions. [2 Marks]

QUESTION THREE (20 MARKS)

(a) Sketch the following types of springs:

- i. Leaf spring.
- ii. Disc spring
- iii. Cylindrical compression spring. [6 Marks]

(b) Describe the following screw fasteners using diagrams:

- i. Through bolt
- ii. Tap bolt
- iii. ~~Stwd~~
- iv. Hexagonal cap screw
- v. ~~Fillster~~ cap screw [10 Marks]

(c) Illustrate the symbols relating to the geometrical tolerances given and the possible application.

- i. Straightness
- ii. Angularity
- iii. Concentricity
- iv. Flatness

[4 Marks]

QUESTION FOUR (20 MARKS)

(a) State the three principle considerations in establishing reasonable tolerances and explain briefly the connection between them. [4½ marks]

(b) With the aid of sketches, illustrate the following fits:

- (i) Clearance
- (ii) Transition
- (iii) Interference

[4½ marks]

(c) Figure 3 shows a pulley assembly. Using the data sheet BS 4500A, calculate the working limits of the different parts in the assembly. [11 marks]

QUESTION FIVE (20 MARKS)

1. Figure 4 shows an elbow joint made from sheet metal. Draw the development of both parts considering the seam positions given. [12 Marks]

2. Figure 5 shows a plan and end elevation of two intersecting branch cylinders.

- i. Redraw the given views,
- ii. Draw the missing front view showing the line of interpenetration of the two cylinders.

[8 Marks]

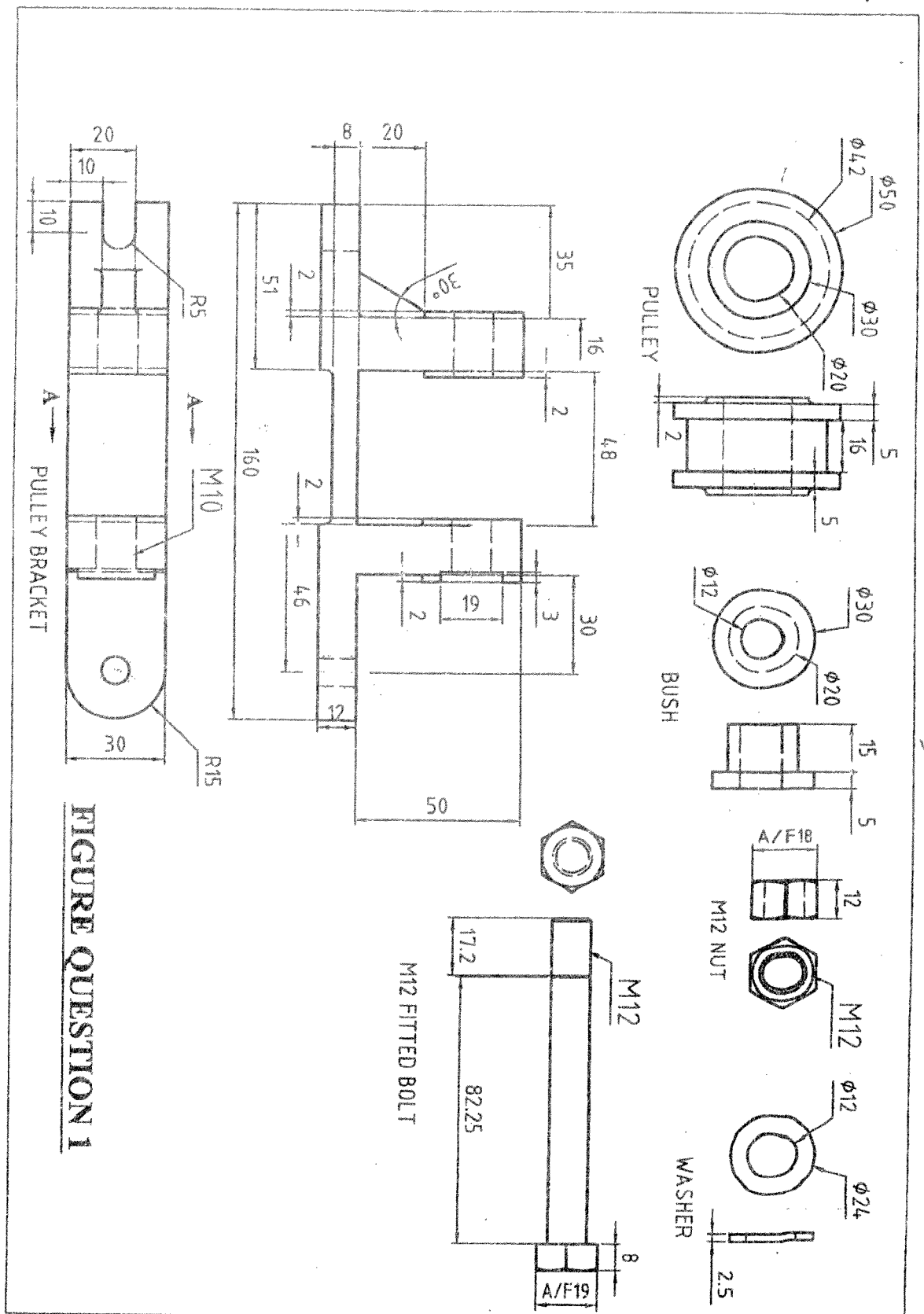


FIGURE QUESTION 1

Figure 1: Question ONE

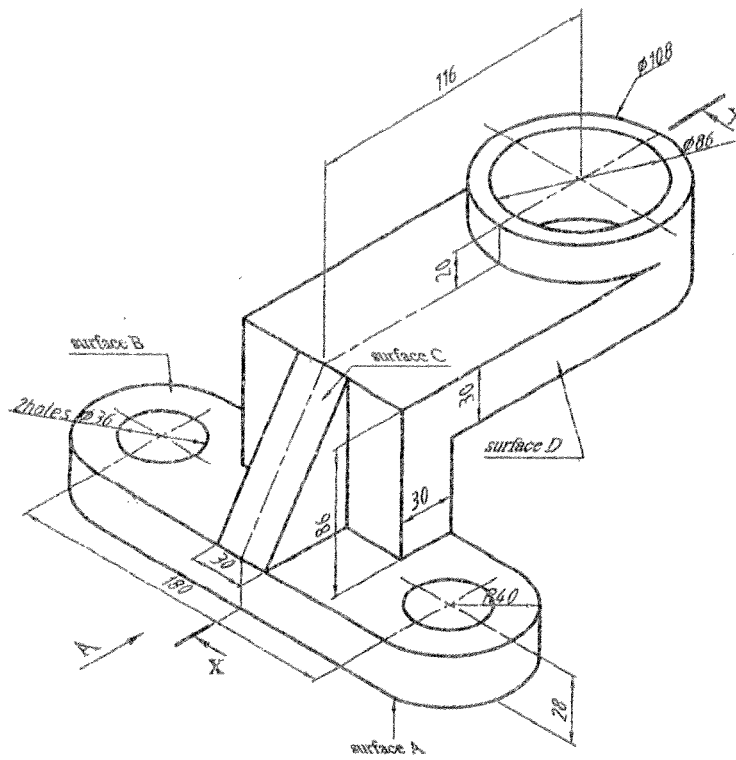


Figure 2: Question TWO

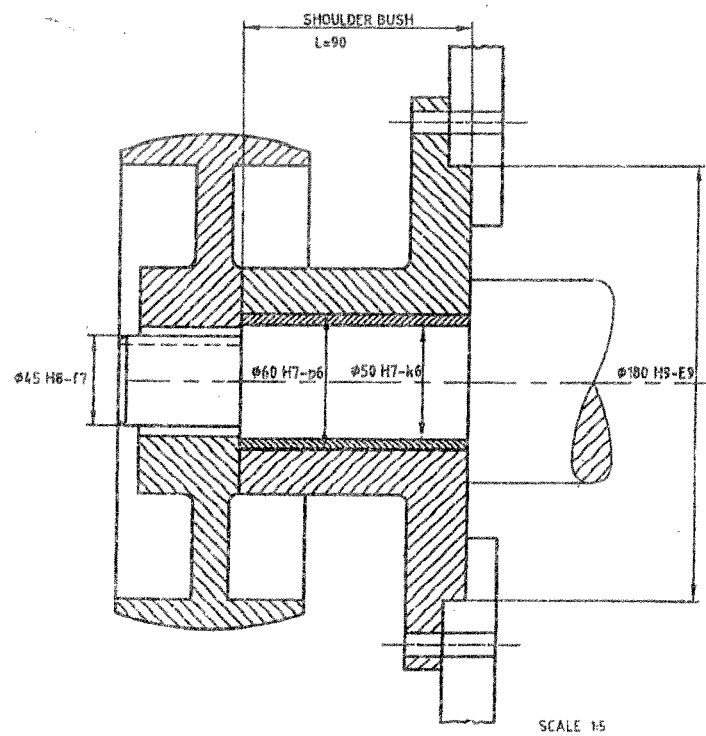
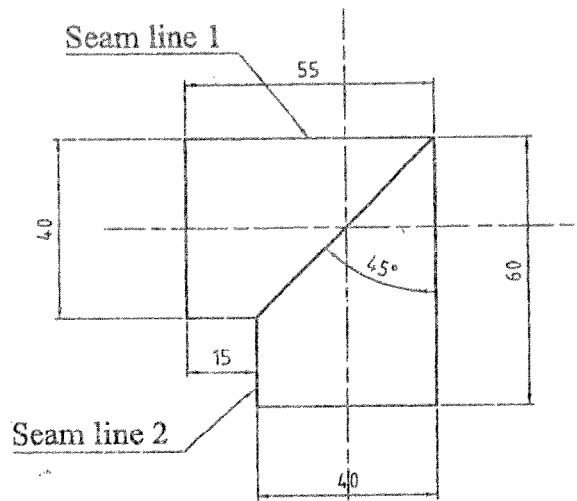


Figure 3: Question FOUR



Dimensions in mm

Figure 4: Question FIVE (a)

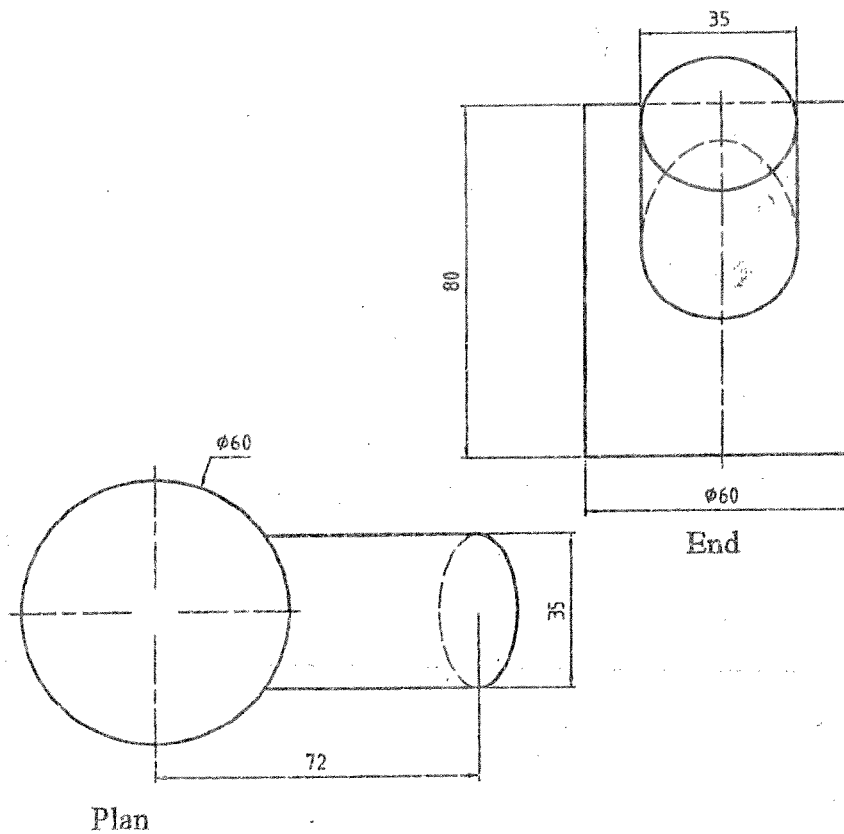


Figure 5: Question FIVE (b)
