2501/301
2503/301
2509/301
COMPUTER AIDED DESIGN
Oct./Nov. 2016
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN MECHANICAL ENGINEERING
(PRODUCTION OPTION)
(CONSTRUCTION PLANT OPTION)
DIPLOMA IN AUTOMOTIVE ENGINEERING

MODULE III

COMPUTER AIDED DESIGN

3 hours

INSTRUCTIONS TO CANDIDATES

*You should have a computer installed with an appropriate **CAD** program, connected to an **A4 printer**.*
indicate the CAD software that you used on your answer sheet
*The paper consists of **TWO** sections; **A** and **B**.*
*Answer question **1** in Section **A (compulsory)** and any **THREE** questions from Section **B**.*
Maximum marks for each part of the question are indicated.
*Write your work on the **CD** provided by your institution. Ensure your index number and college code are labeled on the CD. Hand over the CD to the invigilator at the end of this examination.*
All the Drawing questions should be answered using the CAD program.
Print your work on an ISO A4 paper.
Include your name and index number on each answer sheet that you have used.
All dimensions are in millimeters unless otherwise indicated.
Candidates should answer all questions in English.

This paper consists of 7 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A: (COMPULSORY)

*Answer **ALL** the questions in this section.*

1. (a) Outline **four** advantages of Auto CAD as a drafting software. (4 marks)

   (b) State the functions of the following tools as used in Auto CAD.

   (i) Ortho mode
   (ii) Snap mode
   (iii) Object snap
   (iv) Array.

   (4 marks)

   (c) (i) Differentiate between drafting and design.

   (ii) Using sketches differentiate between an inscribed polygon and a circumscribed polygon.

   (2 marks)

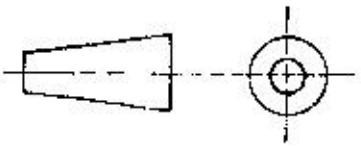
2. With the aid of a computer drafting program, assemble the parts of tool makers clamp shown in Figure 1. Draw the following views in FIRST Angle projection.

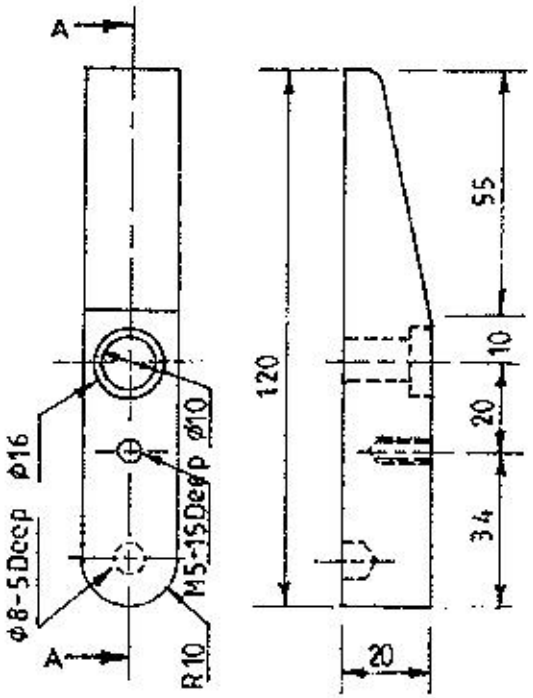
   (a) A sectioned front elevation along section line A-A.

   (b) End elevation.

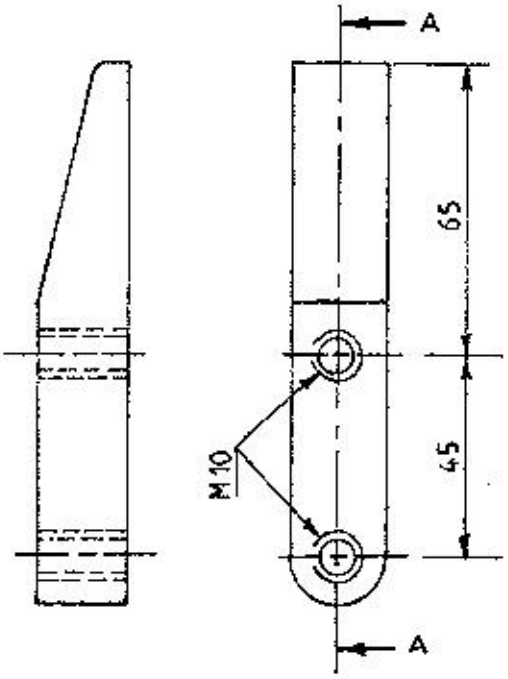
   (c) Include **six** major dimensions and a parts list.

   (30 marks)

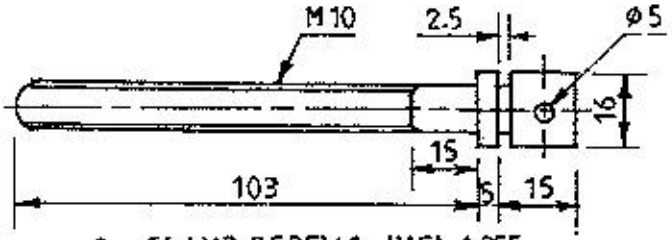




1. CLAMP ARM 1: (MS) 1OFF

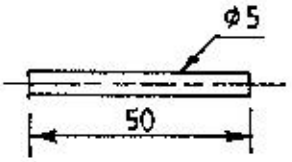


2. CLAMP ARM 2: (MS) 1OFF

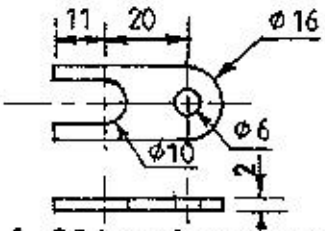


3. CLAMP SCREW 1: (MS) 1OFF

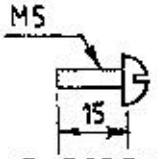
4. CLAMP SCREW 2: (MS) 1OFF



5. PIN: (MS) 2OFF



6. RETAINER: (MS) 1OFF



7. SCREW: (MS) 1OFF

Fig. 1

SECTION B

*Answer any **THREE** questions from this section.*

3. Draw an isometric view of the clamp block shown in figure 2. Print your drawing in grey shading visual style. (20 marks)

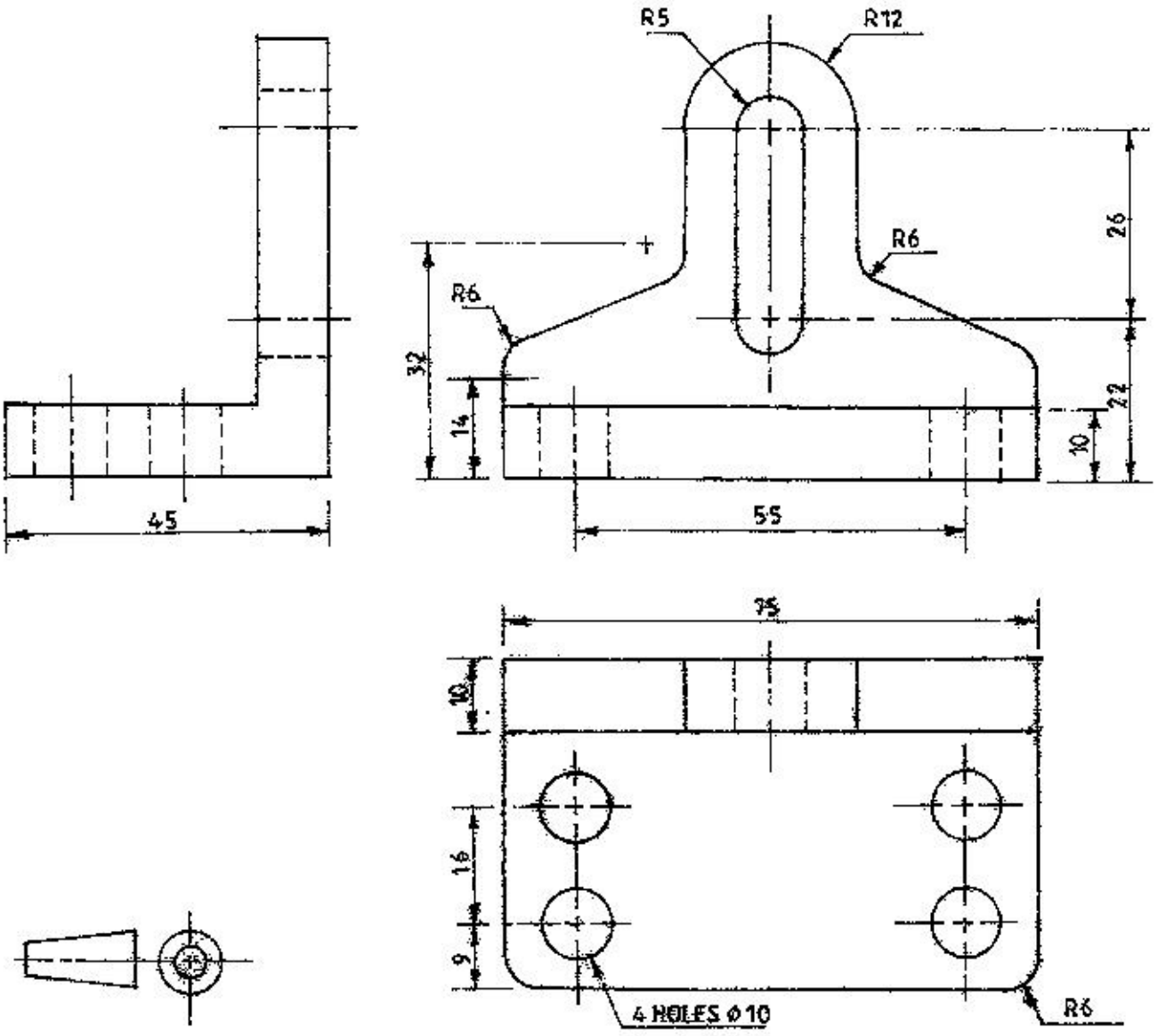


Fig. 2

4. Using a CAD drafting program set the layers properties manager as shown in the table below and use the set up to answer questions below.

Layer Name	Colour	Line Type	Line Weight
Outline	Whit/Black	Continuous	0.5 mm
Centre line	Green	Centre	0.15 mm
Hidden details	Blue	Hidden	0.2 mm
Dimensions	Red	Continuous	Default

(a) Draw an orthographic view of the swivel joint connector shown in Figure 3.

(12 marks)

(b) Draw an isometric projection of Figure 3 and include **four** major dimensions.

(8 marks)

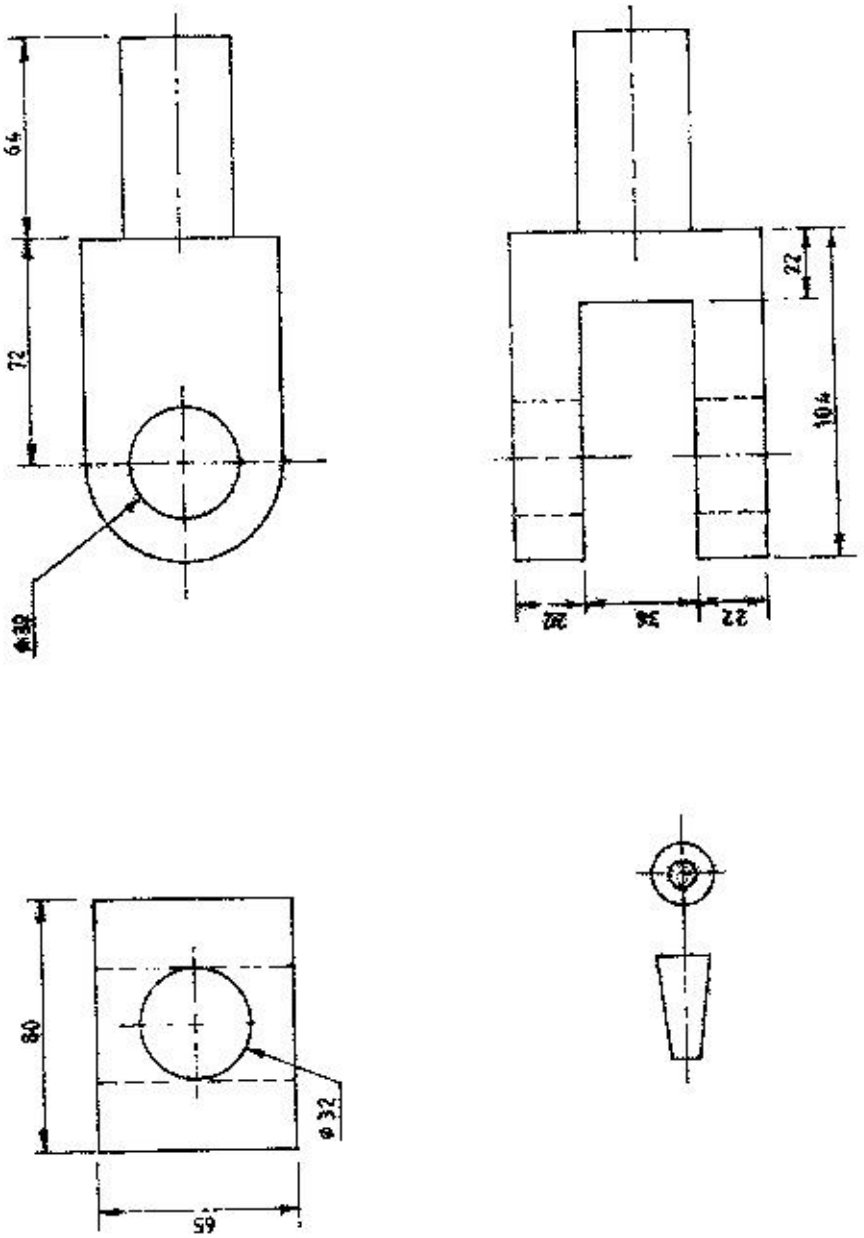


Fig. 3

5. Draw a single cylinder gasket shown in Figure 4. Include six major dimensions.

(20 marks)

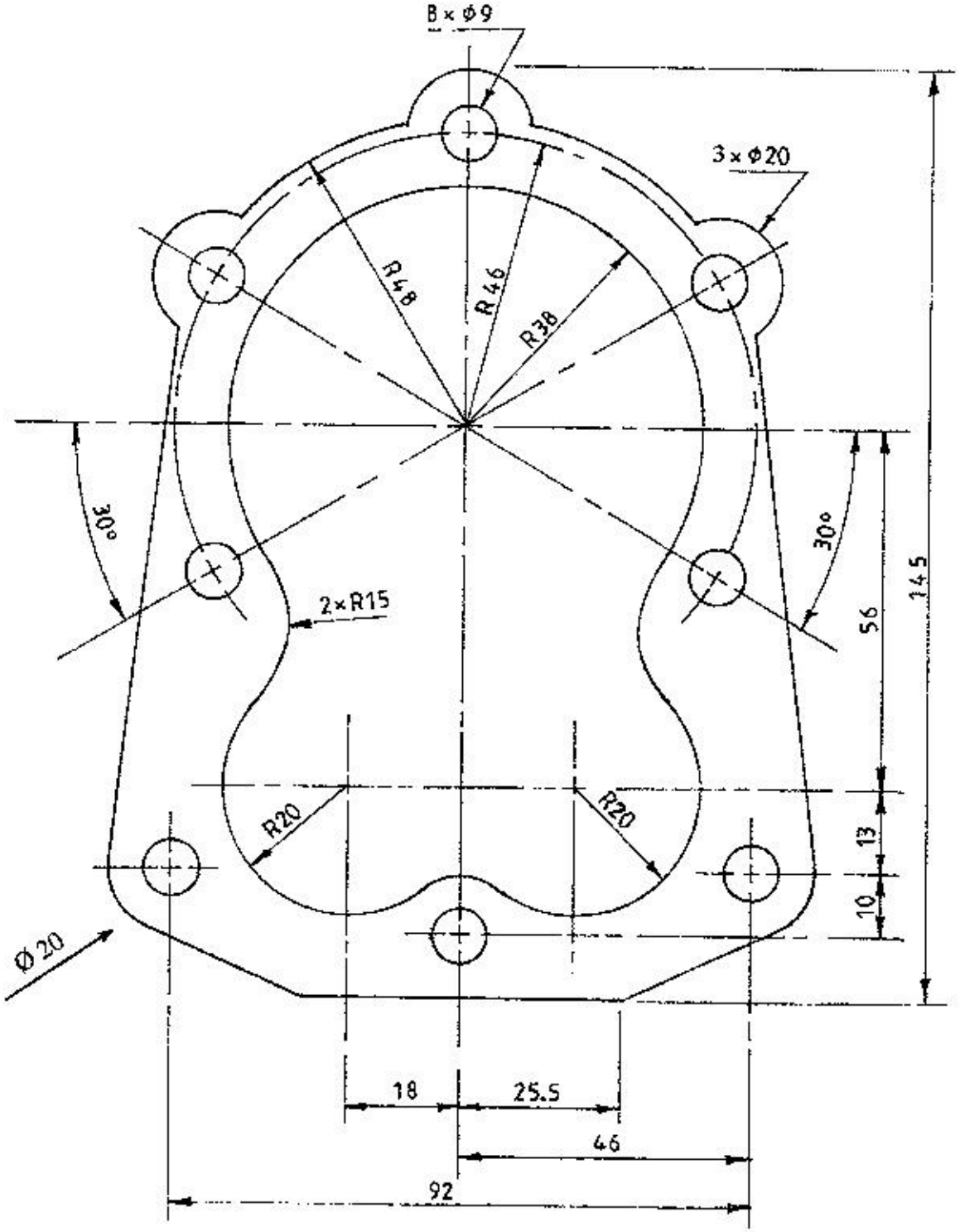


Fig. 4

6. Draw a three dimensional view of figure 5 shown below. Use view ports to extract and label the following elevations in shades of gray visual style in third angle projection.

(a) 3 Dimensional model

(b) Plan elevation

(c) End elevation

(d) Front elevation.

(20 marks)

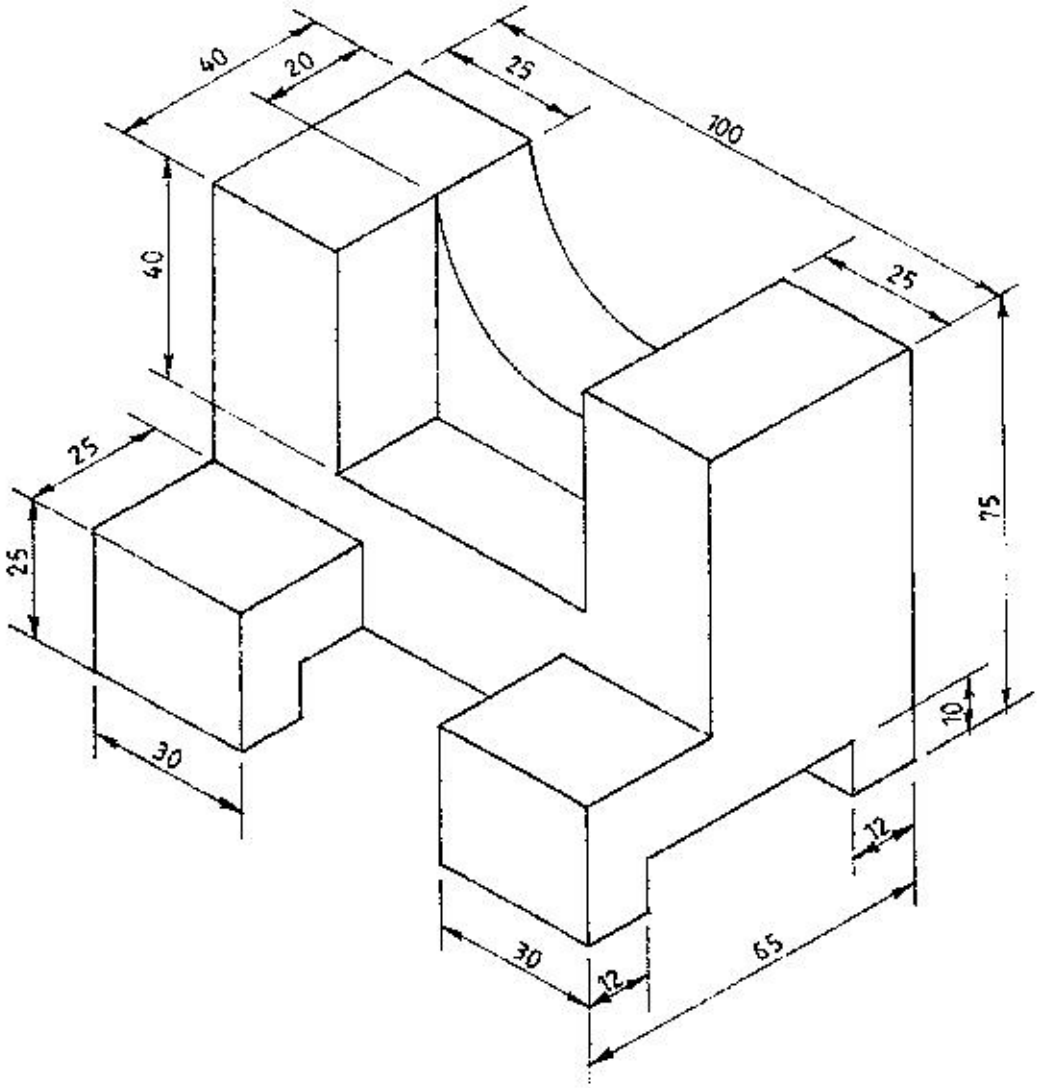


Fig. 5

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