Name:_____ Index No:_____/_____

2601/104, 2603/104
2602/104
ENGINEERING DRAWING,
MATERIALS, PROCESSES AND
WORKSHOP TECHNOLOGY
June/July 2015
Time: 3 hours

Candidate's Signature: _____

Date:_____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING
(POWER OPTION)
(TELECOMMUNICATION OPTION)
(INSTRUMENTATION OPTION)
MODULE I

ENGINEERING DRAWING, MATERIALS, PROCESSES AND WORKSHOP TECHNOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
You should have Drawing instruments and Scientific calculator/mathematical tables and Drawing paper A3 for this examination.
This paper consists of EIGHT questions in TWO sections; A and B.
Answer THREE questions in section A in the spaces provided in this question paper and TWO questions from section B on the drawing paper.
All questions carry equal marks. Maximum marks for each part of a question are as shown.
Do NOT remove any pages from this booklet.
Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A		20	
		20	
		20	
B		20	
		20	
	Total Score	100	

This paper consists of 20 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

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

1. (a) State **two** safety precautions to be observed when using electrical machines. (2 marks)

(b) Table 1, shows types of fire extinguishers. Complete the table indicating the colour of cylinder and class of fire each type extinguishes. (4 marks)

Type	Colour	Class/fire
Water		
Carbon Dioxide		
Dry powder		
Foam		

(c) Distinguish between the following properties of engineering materials:

(i) hardness;
(ii) toughness. (4 marks)

(d) (i) Name **two** copper alloys used in engineering work.

(ii) With the aid of a labelled diagram, explain the extraction of aluminium from its ore. (10 marks)

2. (a) Name **four** measuring tools used in engineering for accurate and precision work. (4 marks)

(b) Draw a labelled diagram of a micrometer screw gauge and show on its scale a reading of 2.96 mm. (8 marks)

(c) (i) Sketch a hacksaw and show **four** main parts.

(ii) State **four** precautions taken while using the hacksaw (c(i)). (8 marks)

3. (a) (i) Define the term soldering.

(ii) State **two** functions of flux in the soldering process. (4 marks)

(b) Sketch the following mechanical fasteners:

(i) bolt and nut;

(ii) stud. (4 marks)

(c) State **three**:

(i) advantages of welding;

(ii) welding positions.

(6 marks)

(d) Sketch an oxy-acetylene gas hose. (6 marks)

4. (a) Name **three**:

(i) sheet metal tools ;

(ii) types of drilling machines.

(6 marks)

(b) Sketch the following tools and state **two** applications of each:

(i) V-Block;

(ii) Engineer's square.

(8 marks)

(c) Sketch a quick return mechanism of a shaping machine.

(6 marks)

SECTION B (40 marks)

Answer any TWO questions from this section.

5. Figure 1 shows a pictorial view of a block bearing.
Draw full size the following views in first angle projection:

(a) front elevation in the direction of arrow A;

(b) end elevation in the direction of arrow B;

(c) plan in the direction of arrow C.

Insert any six major dimensions.

(20 marks)

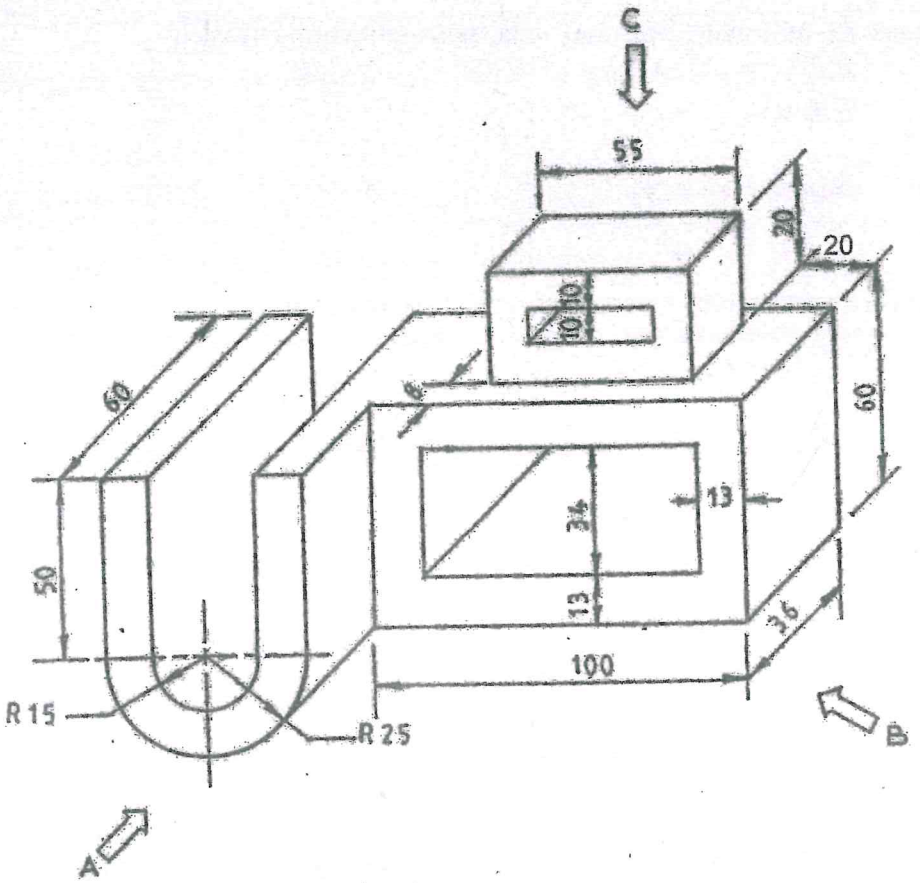

Fig. 1

6. Figure 2 shows an elevation of a truncated cone. Redraw the given elevation and complete the following:

(a) plan;

(b) end elevation;

(c) true shape;

(d) surface development of the frustrum.

(20 marks)

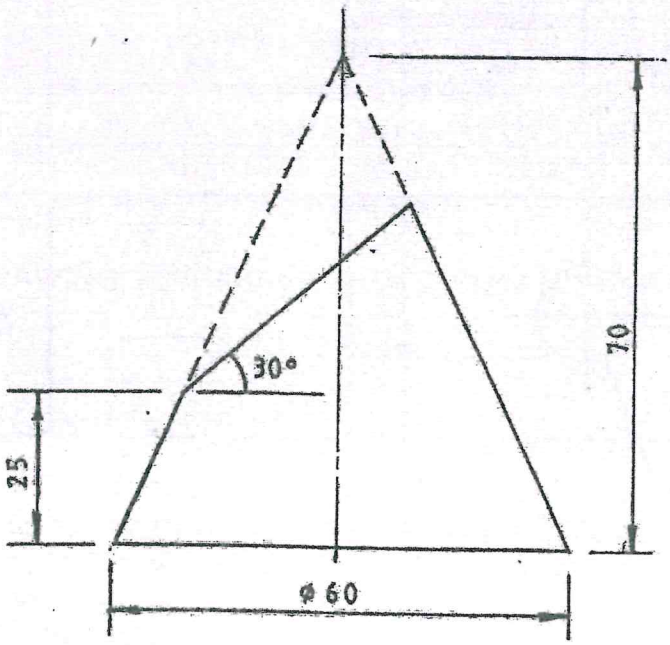

Fig. 2

7. (a) Make free hand sketches of the following hand tools:

(i) electric hand drill;
(ii) cold chisel;
(iii) flat file;
(iv) ball pein hammer;
(v) wall punch.

(10 marks)

(b) Draw a triangle ABC where AB = 60 mm, AC = 60 mm, BC = 55 mm, enscribe a circle along side BC. (5 marks)

(c) Draw a regular octagon in a square of side 80 mm. (5 marks)

8. Figure 3 shows two views of an object drawn in third angle projection.

Draw an isometric view of the object taking corner X as the lowest point.

(20 marks)

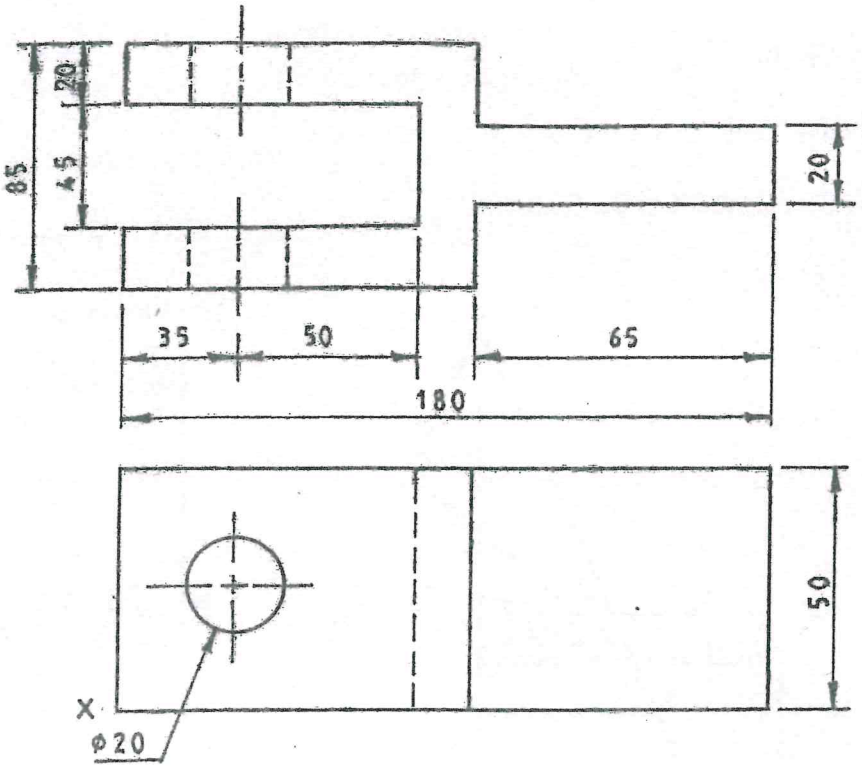

Fig. 3