2601/104 2603/104
2602/104
ENGINEERING DRAWING,
MATERIALS, PROCESSES AND
WORKSHOP TECHNOLOGY
June/July 2016
Time: 3 hours

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

You should have the following for this examination:
Answer booklet;
Mathematical table/Scientific calculator;
Drawing paper A3.
*This paper consists of **TWO** sections; **A** and **B**.*
*Answer **THREE** questions in section **A**, and **TWO** questions from section **B**.*
Maximum marks for each part of a question are indicated.
Candidates should answer the questions in English.

This paper consists of 6 printed pages.

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

Turn over

SECTION A

*Answer any **THREE** questions in this section*

1. (a) State **two**:

   (i) causes of accidents in a workshop;
   (ii) safety measures to be observed to prevent accidents in a workshop. (4 marks)

   (b) Outline the procedure for mouth to mouth method of artificial respiration to rescue an unconscious victim of an electric shock. (6 marks)

   (c) Explain the following properties of engineering materials:

   (i) ductility;
   (ii) malleability. (4 marks)

   (d) With aid of a labelled diagram, explain the process of electroplating a workpiece. (6 marks)

2. (a) Describe the following marking out tools in an engineering workshop:

   (i) scriber;
   (ii) engineer's square. (6 marks)

   (b) State **three** reasons for marking out a piece of metal before cutting and filing. (3 marks)

   (c) Define the term tolerance as used in measurements. (3 marks)

   (d) (i) Sketch and label a micrometer screw gauge.
   (ii) State **two** functions of a micrometer screw guage. (8 marks)

3. (a) State **two**:

   (i) categories of solders;
   (ii) requirements of a good soldering flux. (4 marks)

   (b) Describe the gas cylinders used for oxy-acetylene welding gases. (6 marks)

   (c) State **two**:

   (i) functions of washers;
   (ii) ways a rivet joint may fail. (4 marks)

(d) Sketch the following self-secured joints:

(i) paned-down joint;
(ii) grooved seam;
(iii) knocked-up bottom joint. (6 marks)

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

(i) metals used in sheet metal work;
(ii) products made from sheet metal. (6 marks)

(b) Distinguish between a seam and an edge as used in sheet metal work. (4 marks)

(c) Explain the following lathe machine operations:

(i) facing;
(ii) knurling. (6 marks)

(d) Sketch a labelled diagram of a twist drill bit. (4 marks)

SECTION B

*Answer any **TWO** questions from this section*

5. Figure 1 shows an elevation of a truncated cone. Draw the given elevation and complete the following:

(a) plan;

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

(c) true shape at X - X. (20 marks)

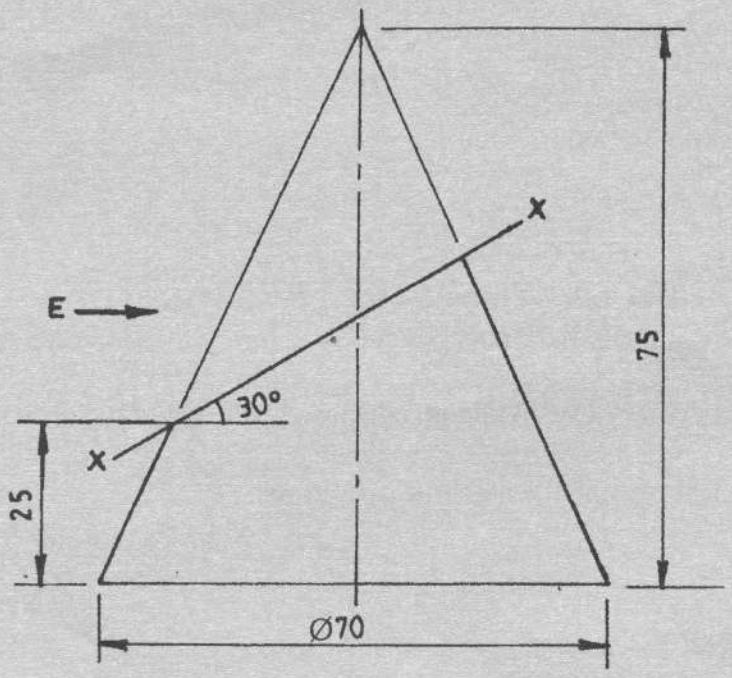

Fig. 1

6. Figure 2 shows two views of a holding down clamp. Draw the clamp full size in oblique cabin projection with face A as the lowest. (20 marks)

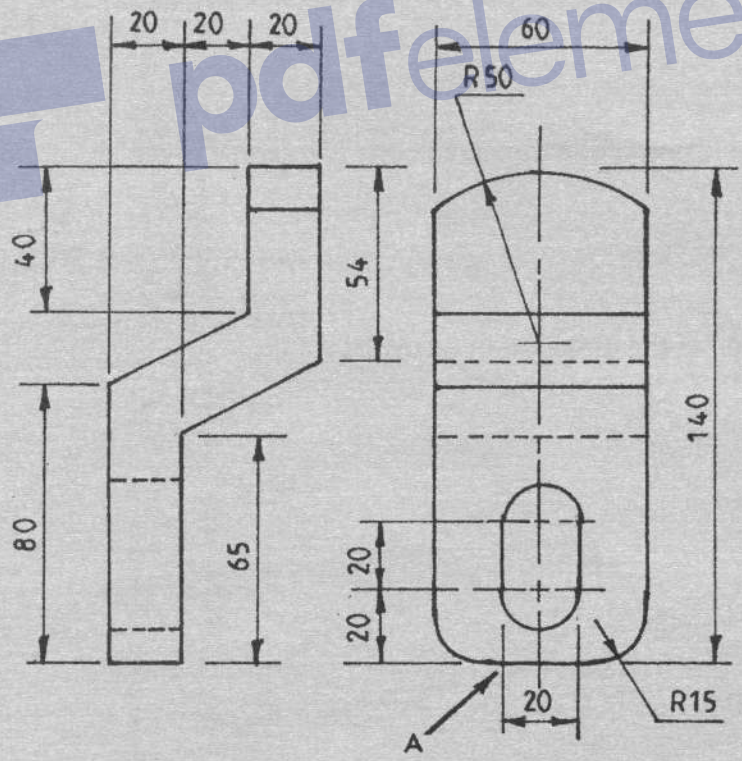

Fig. 2

7. Figure 3 shows the elevation of two dissimilar pipes meeting at an angle. Draw the elevation and complete the following using third angle projection:

(a) the plan;

(b) curve of intersection;

(c) development of both pipes. (20 marks)

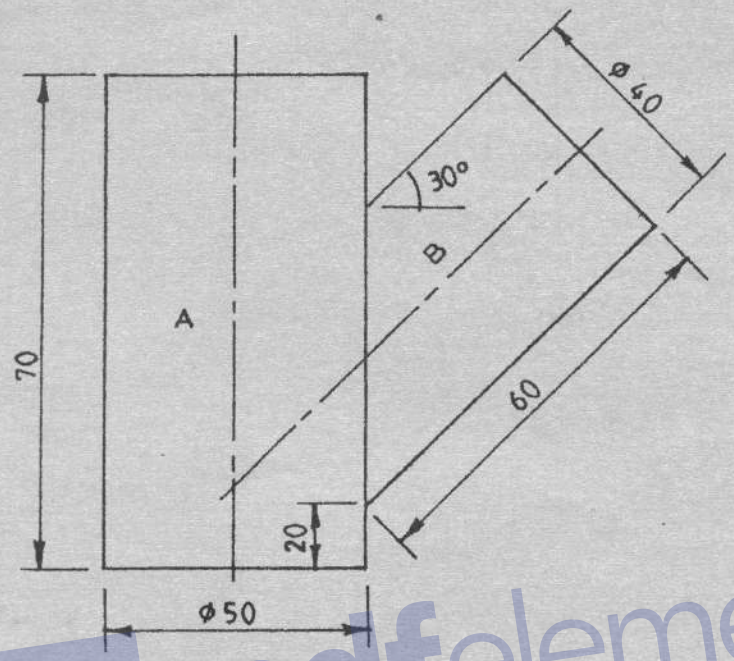

Fig. 3

8. Figure 4 shows a pictorial view of a block. Draw full size in first angle projection the following:

(a) plan in the direction of arrow P;

(b) front elevation in the direction of arrow F;

(c) end elevation in the direction of arrow E.

Insert **six** major dimensions. (20 marks)

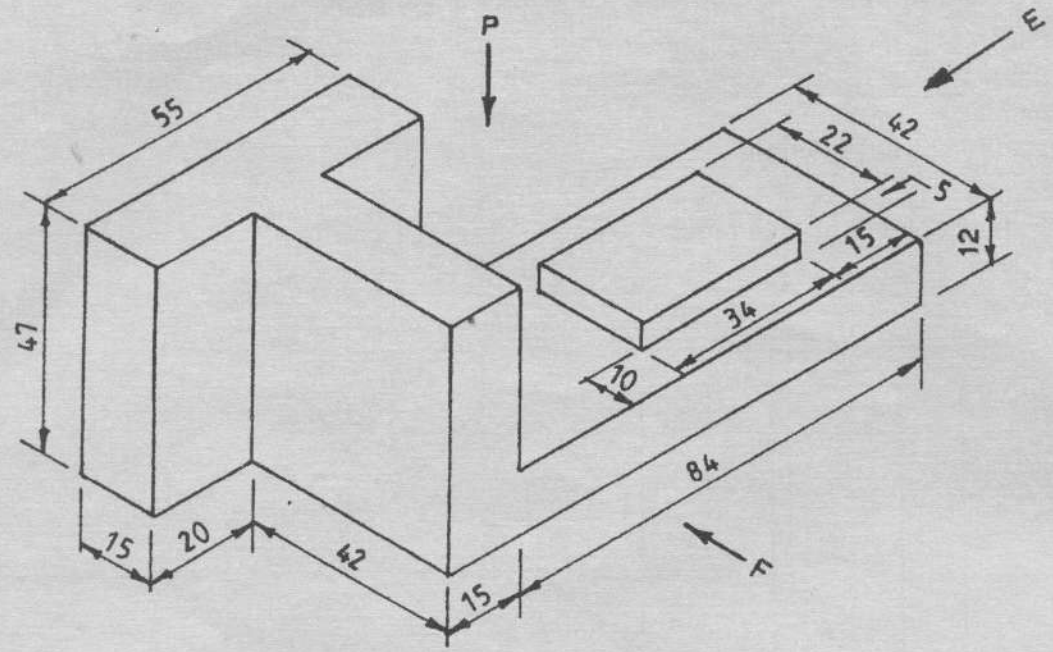

Fig. 4

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