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.

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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) scribe;
       (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 gauge.  (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)  paneed-down joint;
   (ii) grooved seam;
   (iii) knocked-up bottom joint.  

(a) List three:
   (i)  metals used in sheet metal work;
   (ii) products made from sheet metal.  

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

(c) Explain the following lathe machine operations:
   (i)  facing;
   (ii) knurling.  

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

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)
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)
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)

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)