

EXAMINATIONS COUNCIL OF ZAMBIA
Examination for the School Certificate of Education Ordinary Level

**GEOMETRICAL AND MECHANICAL
DRAWING**

PAPER 1

7040/1

Tuesday

22 November 2016

2 hours 30 minutes

Additional materials:

A2 Drawing paper (1 sheet)

Standard drawing equipment

TIME 2 hours 30 minutes

MARKS: 100

INSTRUCTIONS TO CANDIDATES

Print your Name, Centre Number and Candidate Number at the bottom right-hand corner of your drawing paper.

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There are **eight** questions in this paper. Answer **five** questions.

Answer not more than **three** questions from any one section.

Unless otherwise stated, strictly geometrical methods must be used, solutions are to be drawn in full size and no dimensions are required. All construction lines must be shown clearly, but lines which are parallel to, perpendicular to or inclined at angles of **30°**, **45°** or **60°** to other lines may be drawn without showing construction lines.

Use only one sheet of A2 drawing paper

You may use **both** sides of the drawing paper for your answers.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

All dimensions are in millimeters unless otherwise stated.

Cell phones are **not** allowed in the examination room.

This question paper consists of 8 printed pages .

SECTION A

You may answer **two** or **three** questions from this section.

QUESTION 1

- (a) Construct a triangle whose perimeter is **180mm** and its base angles are **$52\frac{1}{2}^\circ$** and **60°** . [8]
- (b) Using geometrical methods, construct a square equal in area to the triangle drawn in (a) above. [8]
- (c) Measure and state the length of the side of the square. [1]
- (d) Circumscribe a circle to a square drawn in (b). [3]

QUESTION 2

Figure 1 below shows the layout plan of a **LAWN**. Curve ABC is $\frac{1}{4}$ of an ellipse. Draw the outline clearly showing all the arc centres and points of tangency.

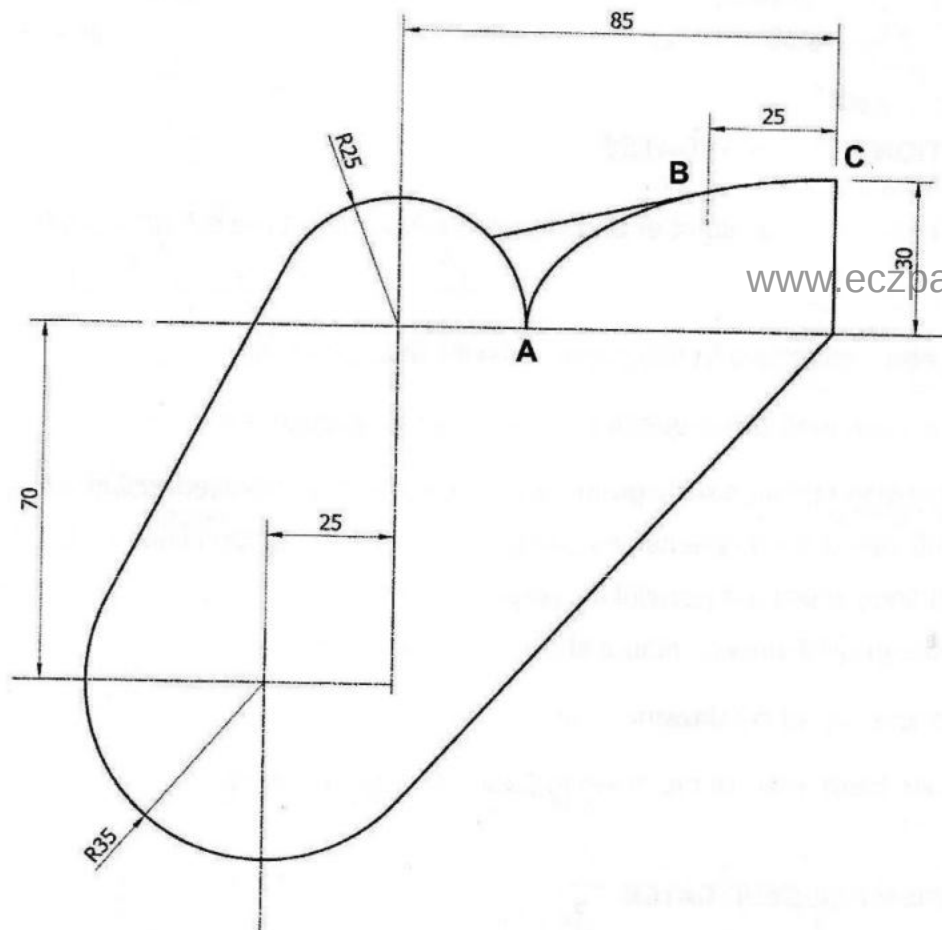


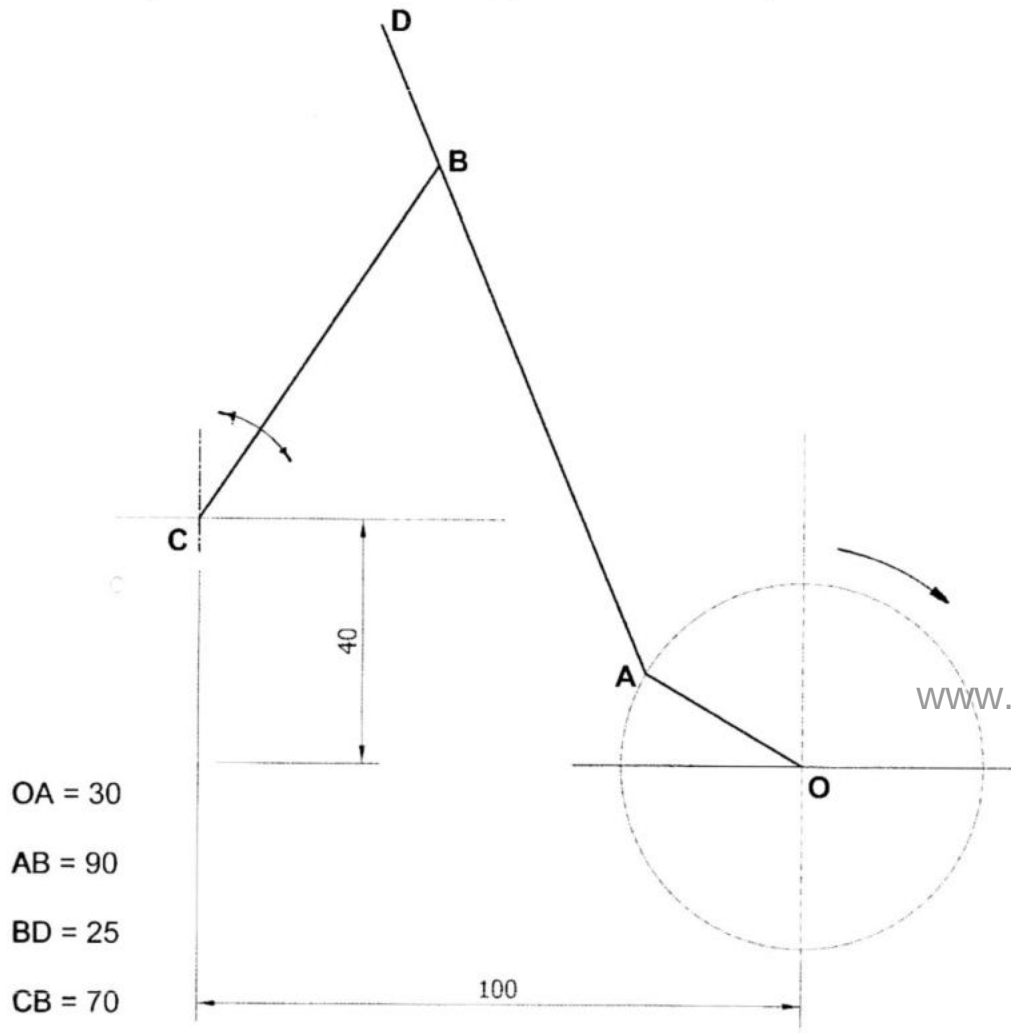
Figure 1

[20]

QUESTION 3

Figure 2 shows a layout of a link mechanism in which crank **OA** rotates clockwise about a fixed centre **O**. **CB** is a rod pin-jointed at **B** and oscillates about centre **C**. Rod **AD** is pin-jointed at **A** and **B**.

For one complete rotation of crank **OA**, plot the **LOCUS** of point **D**.

**FIGURE 2**

[20]

SECTION B SOLID GEOMETRY

Answer not more than **three** questions from this section.

QUESTION 4

Two views of a coping stone are given below in **Figure 3**.

Do not copy the given views but with the use of instruments draw an Isometric View making point 'N' the lowest point.

DO NOT SHOW HIDDEN DETAILS

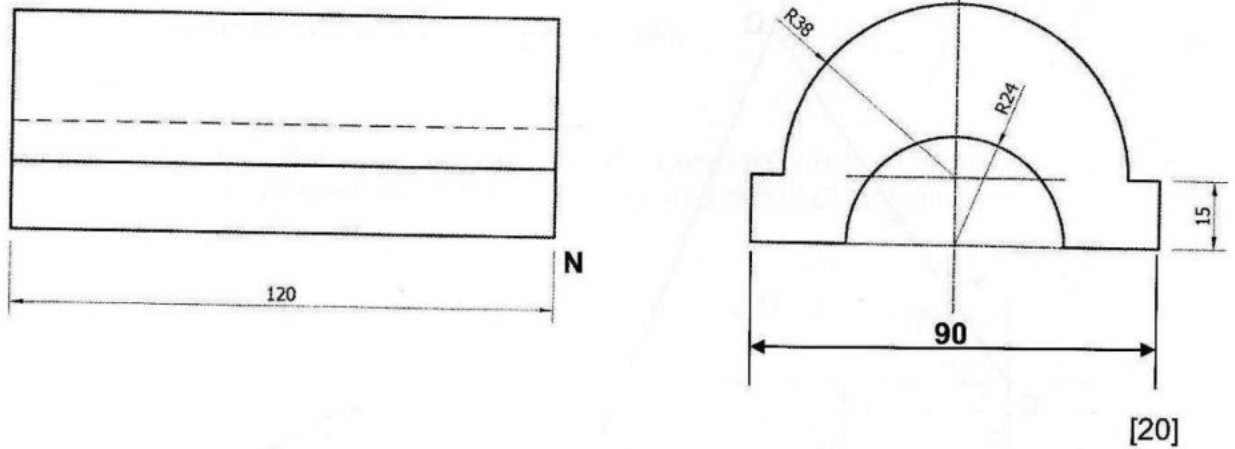


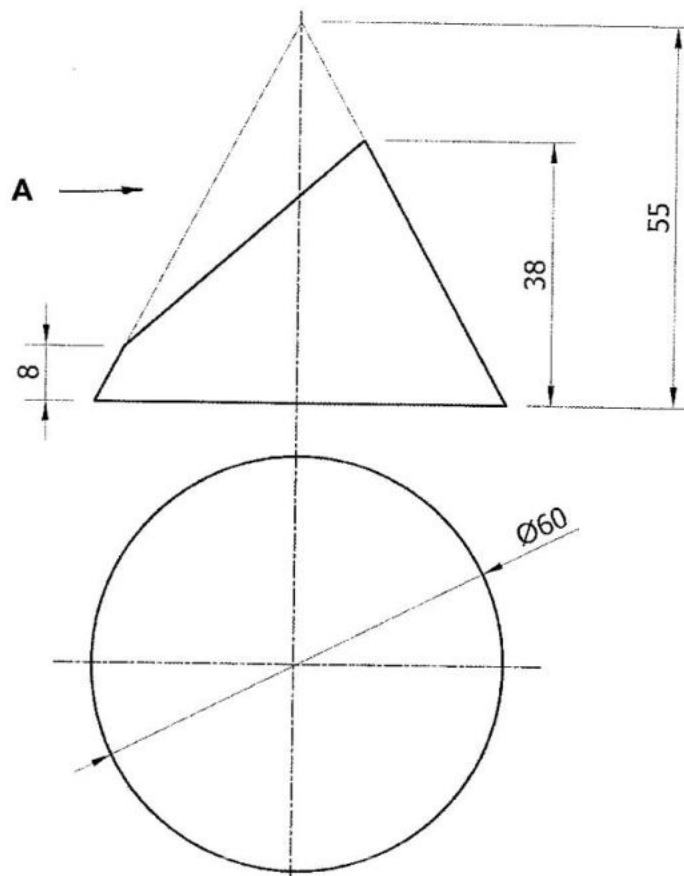
FIGURE 3

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QUESTION 5

Two views of a truncated cone are given in **Figure 4**.

- (a) Draw the given views. [3]
 (b) Project a true shape of the cut surface [11]
 (c) Project an end view looking in the direction of **arrow A**. [6]



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[20]

Figure 4

QUESTION 6

Figure 5 shows a block shaped for an engineering work drawn in **FIRST ANGLE PROJECTION**.

(a) Copy the two views.

[5]

(b) Project an Auxiliary Plan viewed from arrow Y.

[15]

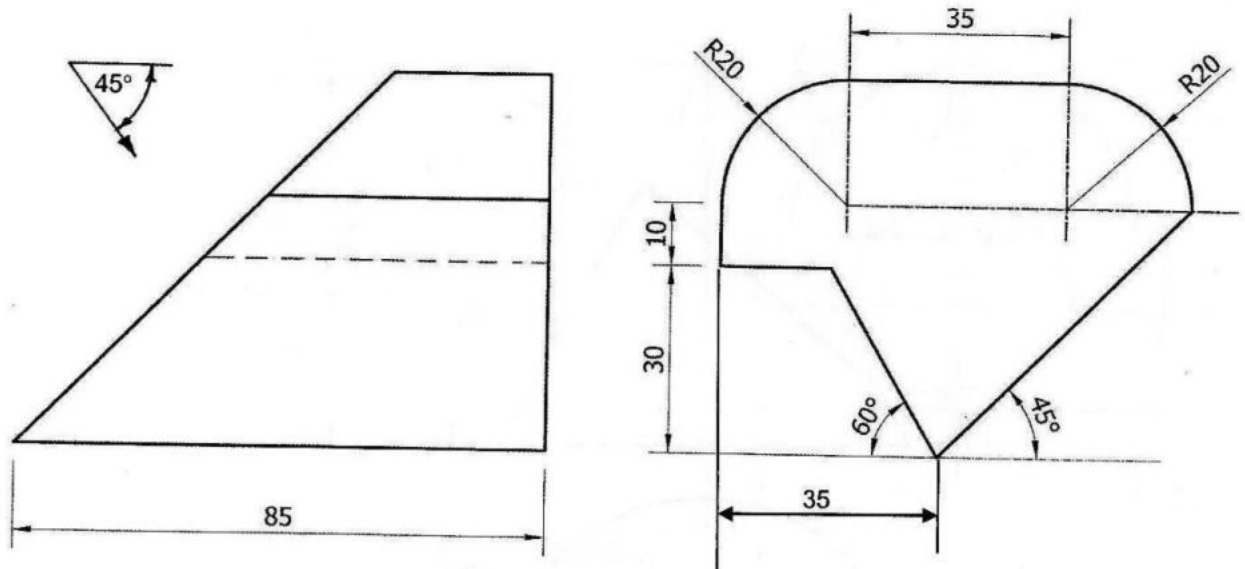


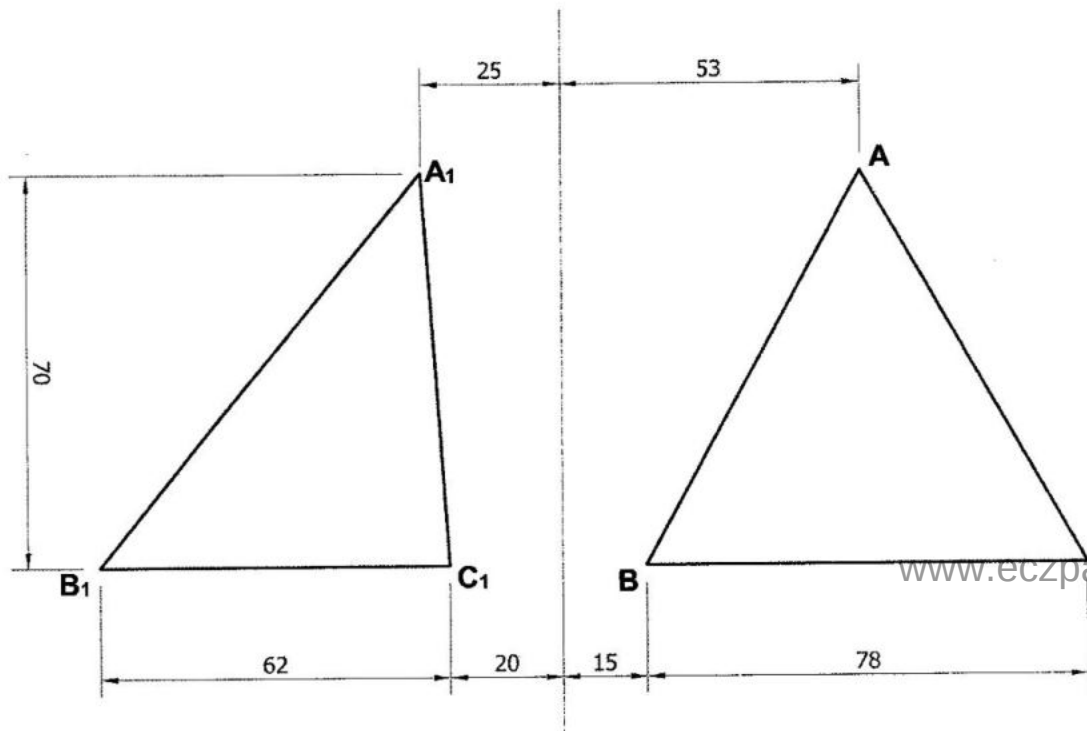
FIGURE 5

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QUESTION 7

Figure 6 below shows a triangular **Lamina**

- (a) Copy the given views. [6]
 (b) Draw the **true shape** of the triangular **lamina**. [12]
 (c) Measure and state the true lengths of sides **AB** and **AC**. [2]

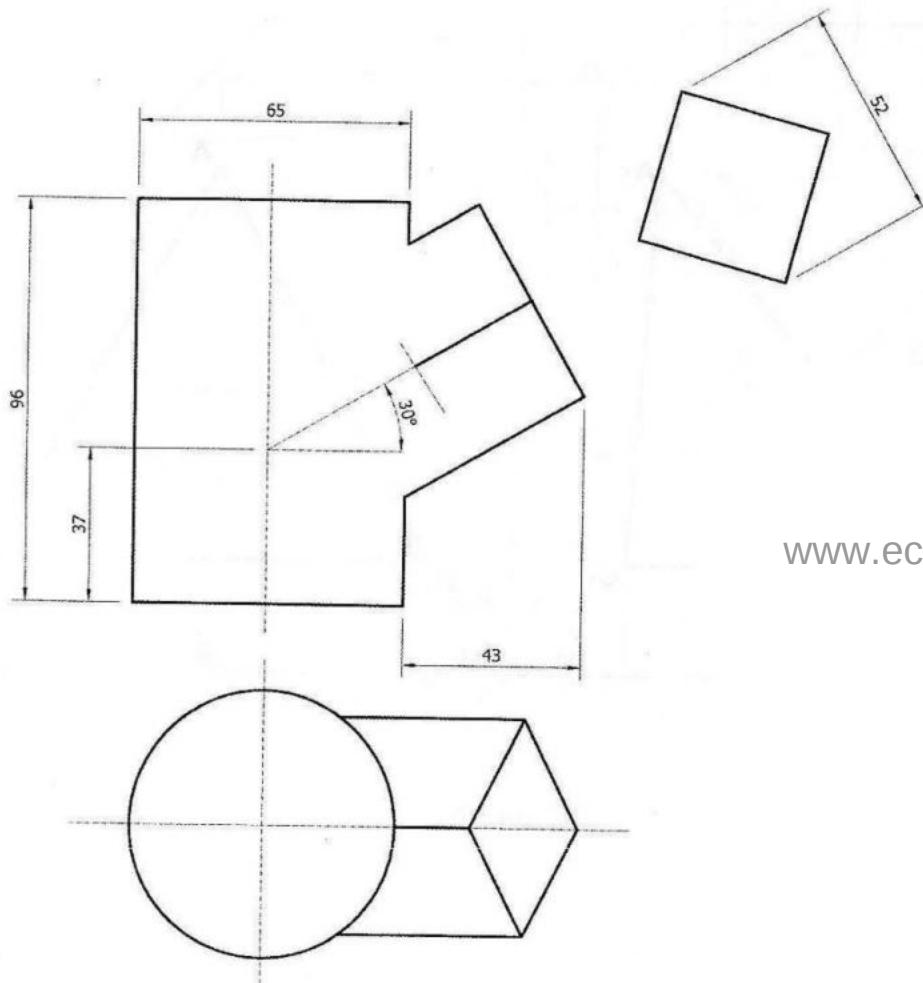
**FIGURE 6**

[20]

QUESTION 8

Figure 7 below shows a Plan and an incomplete **Front Elevation** of a cylinder penetrated by a regular square duct in **First Angle Projection**.

- (a) Copy the given views. [6]
- (b) Complete the front elevation showing the curves of intersection between the cylinder and square prism. [8]
- (c) Draw a surface development of the square duct, when given the seam at **S-S**. [6]



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Figure 7

[20]