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

GEOMETRICAL AND MECHANICAL DRAWING

PAPER 1
Thursday 30 OCTOBER 2014

7040/1

Additional materials:
A2 Drawing paper (1 sheet)
Standard drawing equipments

TIME: 2 hours 40 minutes

MARKS: 100

INSTRUCTIONS TO CANDIDATES

Print your name, centre number and candidate number in the Title Block at the bottom right-hand corner of your drawing paper.

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 should be drawn full size and no dimensions are required. All construction lines must be shown clearly. Lines which are parallel, perpendicular or inclined at angles of 30°, 45° or 60° to other lines may be drawn without showing construction lines.

All the drawings in this question paper are NOT DRAWN TO SCALE.

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 millimetres unless otherwise stated.

Cell phones are not allowed in the examination room.

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SECTION A
PLANE GEOMETRY

Answer two or three questions from this section

QUESTION 1

(a) Construct an irregular pentagon given that

Base $AB = 110$
$BC = 40$
$CD = 75$
$AE = 35$
$DE = 50$

Angle $BAE = 75^\circ$
Angle $ABC = 105^\circ$

(b) Draw a circumscribing circle to the figure to touch points ABC.

(c) State the diameter of the circle.

[Total 20 marks]

QUESTION 2

A wheel of a motorbike rolls on a flat road without slipping for $1\frac{1}{2}$ revolution.

(a) Plot the locus of point P on the wheel of the bike which is initially in contact with the flat road given that the diameter of the wheel is 54mm.

(b) Draw a tangent at point Q which is 36mm above the road, as the point falls in the initial rolling.

(c) Name the locus.

[Total 20 marks]
QUESTION 3

Figure 1 shows the outline of a School Logo.

Draw the school logo showing clearly all geometrical constructions.
SECTION B

SOLID GEOMETRY

Answer not more than three questions from this section.

QUESTION 4

Two views of a spindle housing are shown in third angle projection, in Figure 2.
DO NOT copy the given views but draw full size the spindle housing in Isometric with point A the lowest point in the view. DO NOT show hidden details.

Figure 2

QUESTION 5

A helical thread is made from a 12mm square section steel. The outside diameter is 100mm and the pitch is 30mm. Draw \( \frac{1}{2} \) turns of the thread which is right-hand.

Do not show hidden details.
QUESTION 6
Two views of a BLOCK are shown in first angle projection in figure 3 below.

(a) Draw the given views.  
(b) Project an auxiliary plan looking in the direction of arrow B. Show all hidden details.

[Total 20 marks]
QUESTION 7

The Figure 4 shows the plan and incomplete elevation of two straight lines which meet at B.
Given that line \( A_1B_1C_1 \) meet at \( B_1 \) and point \( C_1 \) is 60mm above the horizontal plane:-

(a) Draw the plan and complete the elevation. [8]

(b) Determine and states the:

(i) True angle between \( AB \) and \( BC \).

(ii) Total true length of the line \( ABC \). [12]
QUESTION 8

Figure 5 shows an incomplete elevation and plan of an equilateral triangular and cylindrical pipes intersecting at 30° in First Angle Projection.

(a) Copy and complete the given views. [12]

(b) Draw the surface development of the cylindrical pipe with the seam along M-M. [8]

[Total 20 marks]
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