THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

FORM TWO NATIONAL ASSESSMENT

091 **ENGINEERING DRAWING**

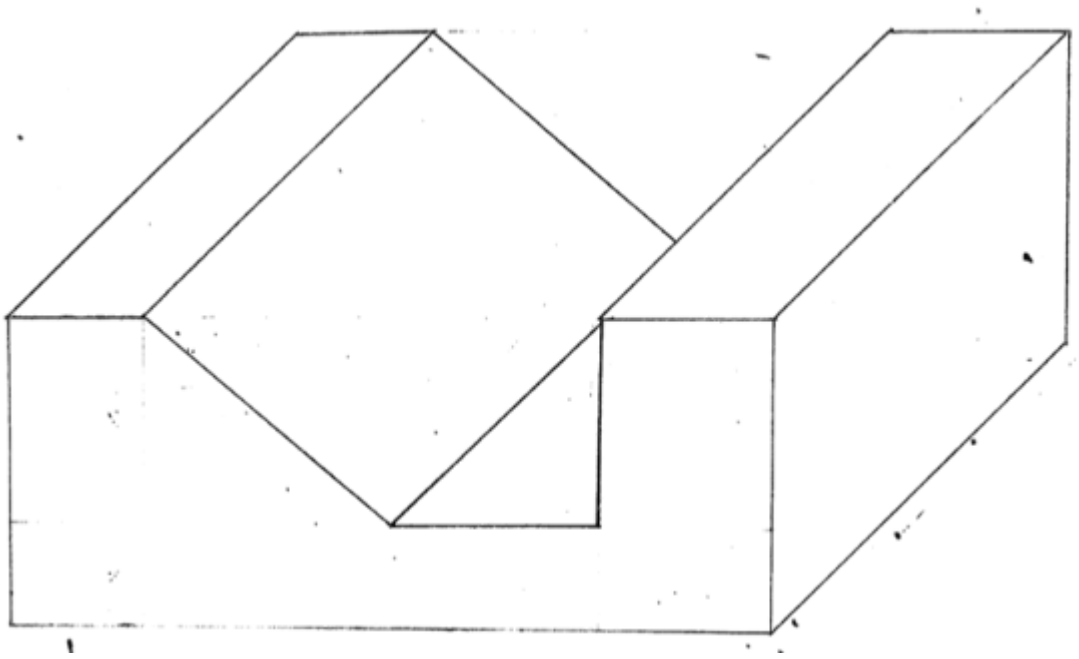
Time: 2:30 Hours. **SOLUTIONS** **Year: 2022**

Instructions

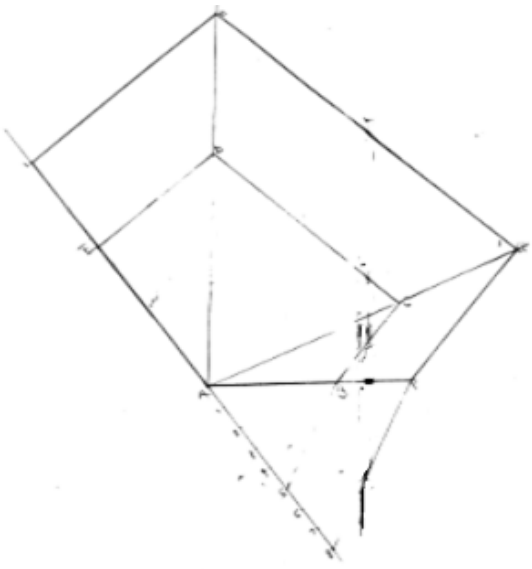
1. This paper consists of sections **A** and **B** with a total of **seven (7)** questions.
2. Answer **all** questions.
3. Section A carries **15** marks; section B carries **70** marks and section C carries **15** marks.
4. All writing must be in **black** or **blue** ink and drawings must be in **pencil**.
5. Cellular phones and unauthorized materials are **not allowed** in the examination room.
6. Write your **Assessment Number** at the top-right hand corner of every page.

FOR EXAMINER'S USE ONLY		
QUESTION NUMBER	**SCORE**	**EXAMINER'S INITIALS**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		
CHECKER'S INITIALS		

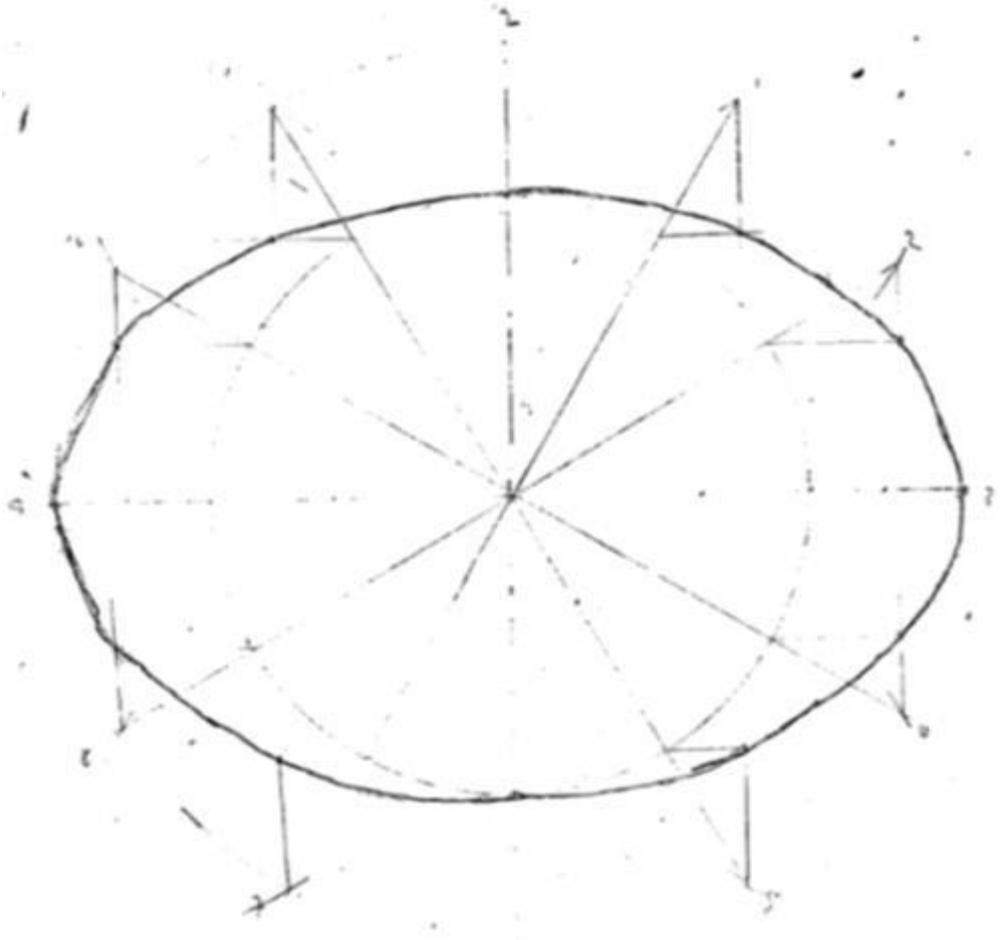
1. Suppose you visited your uncle and found out he is struggling to convert an object below which is drawn in isometric to an oblique projection; draw the expected object after your uncle has completed a task.



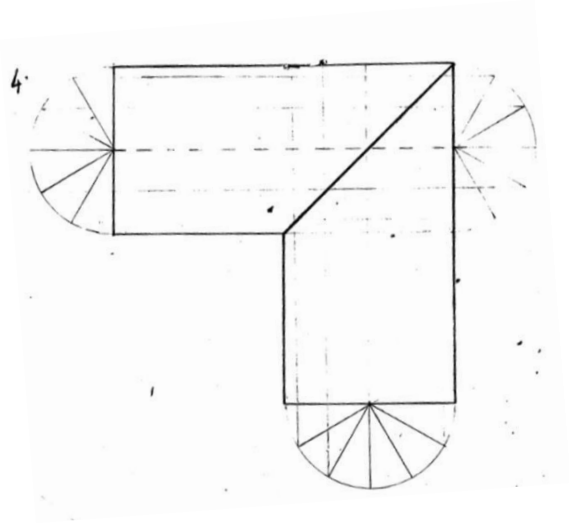
2. The given figure is a sketch of an irregular polygon shape of a housing cover for a machine submitted in drawing office by a welding technician. You are require to fabricate a similar cover but enlarged in length of each side by a ratio of 8:5. Construct the required new cover.



3. A petro station owner wants to change her fuels tank which is in ellipsoidal shape. Using an auxiliary circle method and 120 mm as major diameter and 80 mm minor diameter, construct the required shape.



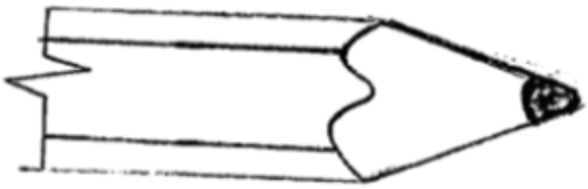
4. The figure provided shows two cylinders joined at a right angle. Construct the lines of intersections. (Don't omit construction lines).



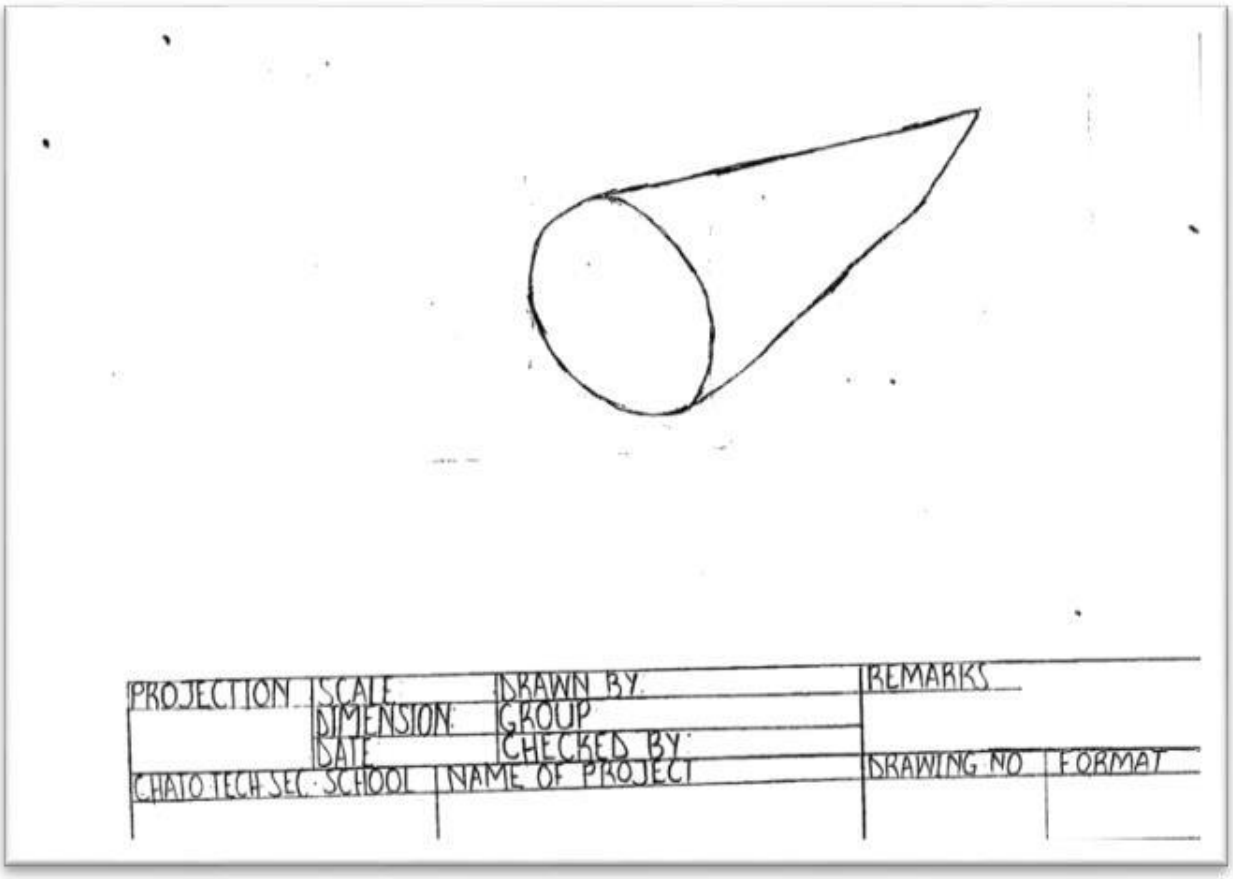
5. (a) Form one students were assigned a tutorial of paper layout. They were provided with tools like drawing sheet, ruler, 2H and 2B pencils. On conducting the task, you observe that the students suffered on how to sharpen their pencils. Provide sketches which will assist them to sharpen their 2H pencil to a chisel point and their HB pencil to a round point.

- Chisel point

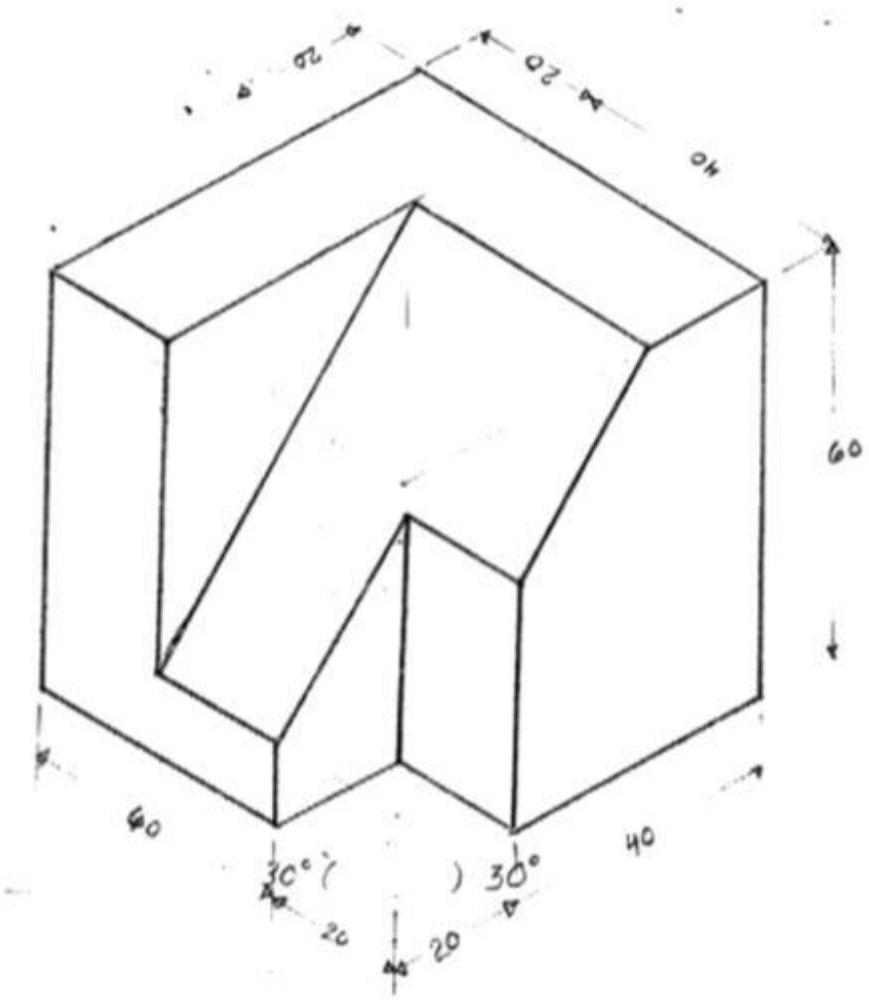
- Round point



(b) A construction company ordered a manufacturing company to make a plumb bob with the specification of 30 mm diameter and 70 mm height. Draw a freehand sketch in isometric projection of a require plumb bob which will help a manufacturer during production of the required component.



6. The figure shows a pictorial drawing of a stopping machine block. Using a scale of 1:1, draw a block into isometric projection.



7. (a) A certain technical school wish to conduct a seminar to students on the use of drawing tools. If you are invited as an expert in engineering drawing, briefly explain the function of the following drawing tools as part of your presentation.

   (i) Drawing board

   A drawing board provides a firm, flat, and stable surface on which drawing work is carried out. It supports the drawing sheet during drafting and ensures accuracy when using tools such as the T-square and set squares by preventing bending or movement of the paper.

   (ii) Drawing sheet (paper)

   A drawing sheet is the surface on which engineering drawings are produced. It

receives pencil or ink lines clearly and neatly, allowing accurate representation of shapes, dimensions, and details according to drawing standards.

(iii) T-square

A T-square is used to draw horizontal lines accurately on the drawing sheet. It also serves as a guide for set squares when drawing vertical and inclined lines, ensuring correct alignment and precision.

(iv) Set square

A set square is used to draw vertical lines and lines inclined at specific angles, commonly 30°, 45°, 60°, and 90°. It works together with the T-square to produce accurate perpendicular and angular lines in technical drawings.

(v) Protractor

A protractor is used to measure and construct angles accurately on a drawing. It allows the drafter to set out angles that are not obtainable using set squares alone.

(vi) Compass

A compass is used to draw circles and arcs with precise radii. It is also useful for transferring distances from one part of a drawing to another while maintaining accuracy.

(vii) Divider

A divider is used to transfer measurements between different parts of a drawing and to divide lines or circles into equal parts. It helps maintain proportional accuracy without drawing visible marks.

(viii) Eraser

An eraser is used to remove unwanted pencil marks from the drawing sheet. It helps keep drawings neat and clear without damaging the paper surface when used correctly.

(ix) Pencil

A pencil is the main tool used to produce lines and details on a drawing sheet. Different grades of pencils are used to control line thickness and darkness, ensuring clarity and proper line quality.

(x) Pencil sharpener

A pencil sharpener is used to maintain a sharp pencil point. A sharp point is essential for producing clean, thin, and accurate lines in engineering drawings.

(b) Given figure shows an irregular polygon ABCDEF. If AB = 85 mm, AF = EF = 75 mm, ED = 35 mm, BC = 60 mm; and angles FAB = AFE = FED = 105^0 and BCD = 90^0; enlarge the figure to the scale of 3:5.