SMARTWIZ

GRADE 12 ENGINEERING GRAPHICS AND DESIGN (EGD) EXAM

MARKS: 100

MARKS	

TIME: 2 HOURS

SCHOOL _____

CLASS (eg. 4A) _____

SURNAME _____

NAME _____

Instructions for Learners:

• Read all instructions carefully before you begin the exam.

• Write your full name and student number clearly on the answer sheet/book.

• Answer all questions unless otherwise instructed.

• Show all your work/calculations where necessary.

• Write neatly and clearly.

• Use only a blue or black pen. Do not use correction fluid or tape.

• Electronic devices (calculators, cell phones, etc.) are not allowed unless explicitly permitted.

• Raise your hand if you have any questions.

• Do not talk to other learners during the exam.

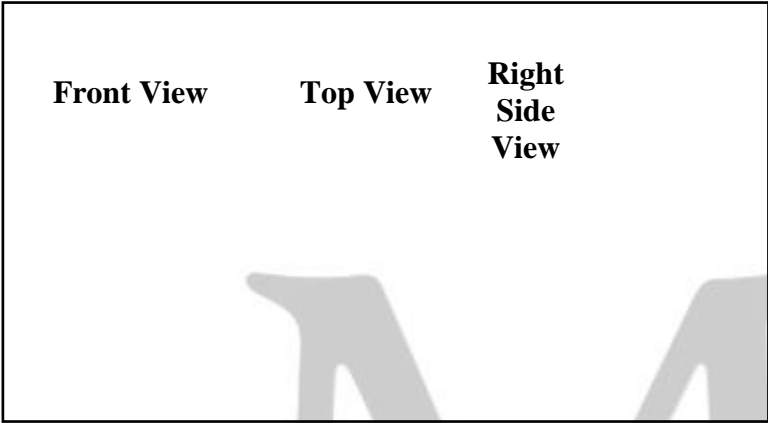• Any form of dishonesty will result in immediate disqualification from the exam.

This exam consists of Five pages, including the cover page.

QUESTION 1: ORTHOGRAPHIC PROJECTION [25 marks]

Draw the **Front View**, **Top View**, and **Right Side View** in the space provided.

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[Visual description
A cube of 40mm edge length with a smaller cube (20mm edge length) cut out from the top
right corner of the front face.]
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Draw your views on the provided grid below:

Front View	Top View	Right Side View

QUESTION 2: ISOMETRIC DRAWING [20 marks]

Draw an **isometric projection** of the following object:

- A rectangular block 60 mm long, 40 mm wide, and 30 mm high.
- A cylinder of diameter 20 mm and height 40 mm is placed centrally on top of the block.
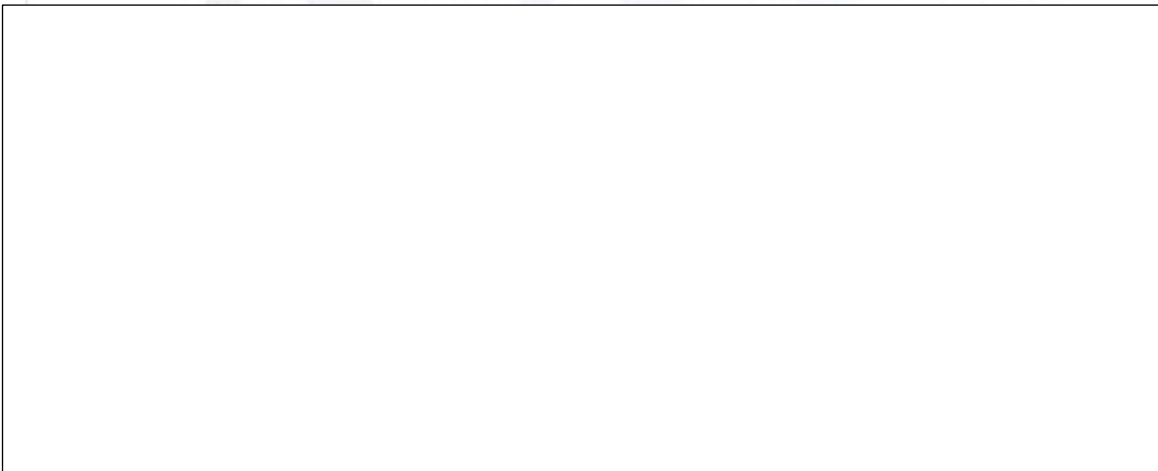
Draw your isometric view here:

QUESTION 3: DEVELOPMENT OF SURFACES [20 marks]

A **cylinder** with diameter 30 mm and height 50 mm.

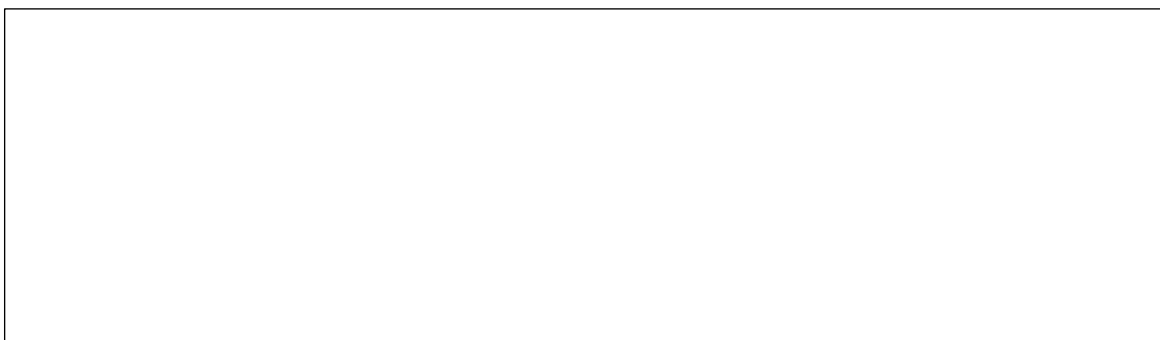**3.1 Draw the front elevation and top view of the cylinder.**

3.2 Draw the development (net) of the cylinder, showing the rectangle (side) and two circles (top and bottom).

QUESTION 4: DIMENSIONING AND SCALE [15 marks]

A mechanical part has the following dimensions: length 120 mm, width 50 mm, height 30 mm.

4.1 Draw the front view to scale 1:2.

4.2 Write the correct dimensions on the drawing with appropriate dimension lines and arrows.

QUESTION 5: TECHNICAL DRAWING THEORY [20 marks]

Answer the following questions briefly:

5.1 What is the purpose of orthographic projection in engineering?

5.2 Explain the difference between first-angle and third-angle projection.

5.3 What are construction lines and why are they important?

✅ **END OF EXAM**

TOTAL : 100

MEMO

QUESTION 1: ORTHOGRAPHIC PROJECTION [25 marks]

- **Front View:**
    - Correct shape and size of main cube (40mm × 40mm).
    - Correctly showing the cut-out smaller cube (20mm × 20mm) on top right corner.
    - Proper lines and edges visible. (8 marks)
- **Top View:**
    - Correct rectangle 40mm × 40mm.
    - Smaller cut-out indicated at correct position (top right corner).
    - All visible edges shown accurately. (8 marks)
- **Right Side View:**
    - Correct height and width (40mm height, 40mm width).
    - Cut-out shown properly in correct position. (9 marks)

QUESTION 2: ISOMETRIC DRAWING [20 marks]

- Rectangular block correctly drawn (60mm long, 40mm wide, 30mm high) with proper isometric angles (30° from horizontal). (10 marks)
- Cylinder drawn centrally on top of block, correct diameter (20mm) and height (40mm). (10 marks)

QUESTION 3: DEVELOPMENT OF SURFACES [20 marks]

- **3.1 Front elevation:** Correct circle with diameter 30 mm, height 50 mm rectangle.
- **Top view:** Correct circle diameter 30 mm. (8 marks)
- **3.2 Development:**
    - Rectangle 50 mm (height) × circumference of circle (approx. 94.2 mm).
    - Two circles with diameter 30 mm correctly drawn at ends. (12 marks)

QUESTION 4: DIMENSIONING AND SCALE [15 marks]

- **4.1 Front view drawn to scale 1:2:**
    - Length 60 mm (half of 120 mm), width 25 mm, height 15 mm shown accurately. (8 marks)
- **4.2 Dimensioning:**
    - Dimension lines with arrows, clear and correctly placed dimensions (120 mm, 50 mm, 30 mm). (7 marks)

QUESTION 5: TECHNICAL DRAWING THEORY [20 marks]

- **5.1 Purpose of orthographic projection:**
  - To represent a 3D object in 2D views to show all dimensions accurately for manufacturing or construction. (6 marks)
- **5.2 Difference between first-angle and third-angle projection:**
  - First-angle: Object placed between observer and plane; views arranged differently (Europe).
  - Third-angle: Plane placed between observer and object; commonly used in USA. (7 marks)
- **5.3 Construction lines:**
  - Light lines used to guide drawing shapes before final lines are drawn.
  - Important for accuracy and clarity. (7 marks)

✅ **END OF MEMO**

TOTAL :100