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: PICTORIAL TO ORTHOGRAPHIC [25 marks]

The description below describes a 3D object:

[Visual description:
A rectangular prism 70 mm long, 40 mm wide, and 30 mm high with a triangular prism cut out from the top surface on the left side. The triangular prism has a base of 40 mm and height of 20 mm.]

1.1 Draw the Front View of the object.

1.2 Draw the Top View of the object.

1.3 Draw the Left Side View of the object.

QUESTION 2: ISOMETRIC PROJECTION [20 marks]

Draw an isometric view of a **right circular cone** with a base diameter of 40 mm and height 60 mm.

Draw your isometric projection here:

QUESTION 3: DEVELOPMENT OF SURFACES [20 marks]

A **pentagonal prism** has a base edge length of 30 mm and a height of 50 mm.

3.1 Draw the front elevation and plan view of the prism.

3.2 Draw the development (net) of the pentagonal prism.

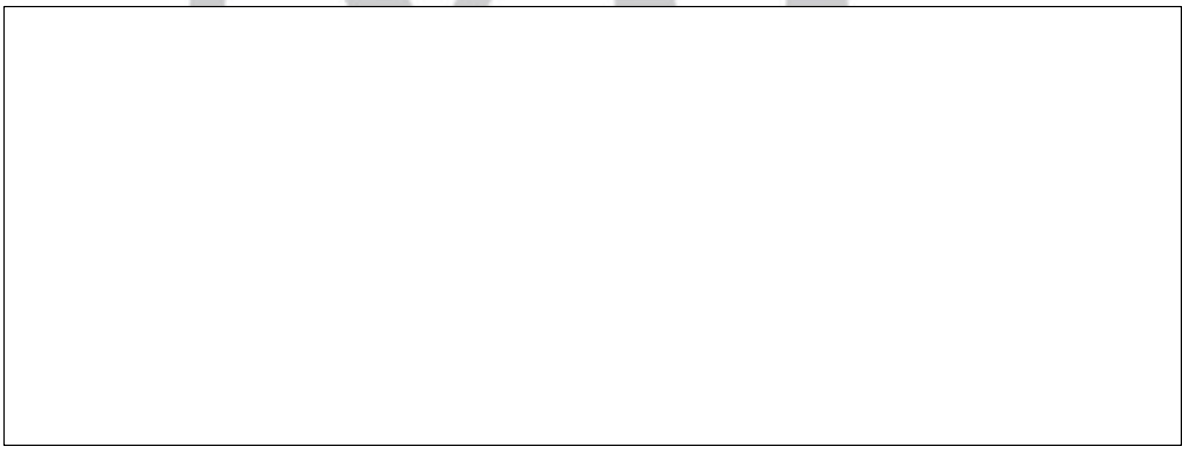
QUESTION 4: SECTIONAL VIEWS [15 marks]

The figure below shows a rectangular block with a cylindrical hole drilled through the centre from top to bottom.

- Block dimensions: 80 mm long, 50 mm wide, 40 mm high.
- Hole diameter: 20 mm.

4.1 Draw the front elevation showing the hole in section.

4.2 Draw the top view of the block showing the hole.



QUESTION 5: TECHNICAL DRAWING THEORY [20 marks]

Answer briefly:

5.1 What is the purpose of sectional views in technical drawings?

5.2 Explain the difference between full section and half section drawings.

5.3 What is the importance of scale in technical drawings?

✅ **END OF EXAM**

TOTAL : 100

MEMO

QUESTION 1: PICTORIAL TO ORTHOGRAPHIC [25 marks]

- **Front View:**
  - Correct rectangle base 70 mm long × 30 mm high.
  - Triangular cut-out clearly shown on the top left (base 40 mm, height 20 mm). (8 marks)
- **Top View:**
  - Correct rectangle 70 mm long × 40 mm wide.
  - Triangular cut-out shown at the left side of the top surface. (9 marks)
- **Left Side View:**
  - Correct height (30 mm) and width (40 mm).
  - Triangular cut visible in correct position. (8 marks)

QUESTION 2: ISOMETRIC PROJECTION [20 marks]

- Correct isometric cone shape.
- Base drawn as an ellipse with correct proportions (diameter 40 mm).
- Height (60 mm) shown properly. (20 marks)

QUESTION 3: DEVELOPMENT OF SURFACES [20 marks]

- **3.1 Front elevation:** Correct pentagon with base edges 30 mm and height 50 mm.
- **Plan view:** Correct pentagonal shape base (5 sides, 30 mm edges). (8 marks)
- **3.2 Development:**
  - Accurate layout of 5 rectangular faces (height 50 mm × base edge 30 mm).
  - Two pentagons for top and bottom correctly drawn. (12 marks)

QUESTION 4: SECTIONAL VIEWS [15 marks]

- **4.1 Front elevation in section:**
  - Block dimensions 80 mm × 40 mm correctly shown.
  - Hole (20 mm diameter) shown as a rectangle with hatch lines indicating sectioning. (8 marks)
- **4.2 Top view:**
  - Rectangle 80 mm × 50 mm.
  - Circular hole (20 mm diameter) in centre. (7 marks)

QUESTION 5: TECHNICAL DRAWING THEORY [20 marks]

- **5.1 Purpose of sectional views:**
  - To show internal features of an object that cannot be seen in external views. (6 marks)
- **5.2 Difference between full and half sections:**
  - Full section: Object cut fully along a plane, showing the entire internal profile.
  - Half section: Only half of the object is cut and the other half remains as an external view. (7 marks)
- **5.3 Importance of scale:**
  - Ensures the drawing fits on paper and represents the object proportionally.
  - Allows accurate measurement and communication of size. (7 marks)

✅ **END OF MEMO**

TOTAL : 100