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: MULTI-VIEW DRAWING [25 marks]

Visual Description:
A **step block** consists of three rectangular steps:

- Bottom step: 80 mm long, 40 mm wide, 20 mm high
- Middle step: 60 mm long, 40 mm wide, 20 mm high, placed on top of bottom step at one end
- Top step: 40 mm long, 40 mm wide, 20 mm high, placed on middle step at the same end

Tasks:

1. Draw the **front view** showing the steps clearly.
2. Draw the **top view** showing the outline of the steps.
3. Draw the **right side view**.

Draw in the space below (or on separate sheets):

QUESTION 2: ISOMETRIC DRAWING [20 marks]

Draw an isometric view of the following:

- A **hexagonal pyramid** with a base edge of 40 mm and height of 60 mm.

Draw your isometric projection here:

QUESTION 3: INTERPRETING A WORKING DRAWING [20 marks]

Below is a simplified description of a **mechanical bracket**:

- A rectangular plate 100 mm long, 60 mm wide, 20 mm thick.
- Two circular holes of diameter 15 mm drilled through the plate at 20 mm from each end along the length and centered along the width.

Tasks:

1. Draw the **front view** of the bracket showing the holes.
2. Draw the **top view** showing the hole positions.
3. Add correct dimensioning and labeling.

Draw in the space below:

QUESTION 4: DEVELOPMENT AND SURFACING [15 marks]

Visual Description:
A **right circular cone** with a base diameter of 50 mm and height of 70 mm.

Tasks:

1. Draw the **front elevation** and **plan view** of the cone.
2. Draw the **development (net)** of the cone showing the sector (lateral surface) and base circle.

Draw in the space below:

QUESTION 5: THEORY QUESTIONS [20 marks]

Answer briefly:

5.1 Define the term “sectional view” and explain when it is used.

5.2 What are hidden lines and how are they represented in drawings?

5.3 Describe the importance of dimensioning in engineering drawings.

✅ **END OF EXAM**

TOTAL : 100

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QUESTION 1: MULTI-VIEW DRAWING [25 marks]

- **Front view:**
  - Correct depiction of three steps stacked, showing heights (20 mm each).
  - Bottom step 80 mm long × 20 mm high, middle step 60 mm long × 20 mm high on one end, top step 40 mm long × 20 mm high on same end.
  - Clear edges and lines. (9 marks)
- **Top view:**
  - Outline shows steps reducing in length from 80 mm (bottom) to 40 mm (top).
  - Width constant at 40 mm. (8 marks)
- **Right side view:**
  - Steps shown with correct heights, aligned properly.
  - Width (40 mm) consistent. (8 marks)

QUESTION 2: ISOMETRIC DRAWING [20 marks]

- Hexagonal base drawn with six equal edges of 40 mm.
- Pyramid apex positioned correctly at 60 mm above the base center.
- Proper isometric angles and neat lines. (20 marks)

QUESTION 3: INTERPRETING A WORKING DRAWING [20 marks]

- **Front view:**
  - Rectangle 100 mm long × 20 mm thick × 60 mm wide shown with two circular holes visible as circles.
  - Holes placed 20 mm from each end, centered in width. (8 marks)
- **Top view:**
  - Rectangle 100 mm × 60 mm with holes shown as circles.
  - Hole positions correct (20 mm from ends, centered). (7 marks)
- **Dimensioning:**
  - Correct use of dimension lines, arrows, and labels (hole diameters, distances from edges). (5 marks)

QUESTION 4: DEVELOPMENT AND SURFACING [15 marks]

- **Front elevation:**
  - Cone drawn with base diameter 50 mm, height 70 mm. (5 marks)
- **Plan view:**
  - Circle with diameter 50 mm. (3 marks)
- **Development (net):**
  - Sector (lateral surface) drawn with arc length = circumference of base (≈157 mm).
  - Radius = slant height = $\sqrt{(70^2 + 25^2)}$ = approx. 74 mm (show calculation for slant height).
  - Base circle included. (7 marks)

QUESTION 5: THEORY QUESTIONS [20 marks]

- **5.1 Sectional view:**
  - A view showing the internal features of an object by cutting through it.
  - Used to reveal hidden internal details that cannot be seen in normal views. (6 marks)
- **5.2 Hidden lines:**
  - Represent edges or boundaries that are not visible from the viewing angle.
  - Shown as dashed lines (short dashes evenly spaced). (7 marks)
- **5.3 Importance of dimensioning:**
  - Provides exact sizes, locations, and tolerances for manufacturing or construction.
  - Ensures accurate communication between designer and manufacturer. (7 marks)

MYST PATHWORKS

✅ **END OF MEMO**

TOTAL : 100