

**ENGINEERING GRAPHICS AND DESIGN**  
**GRADE 10**  
**MAY 2024**  
**TOTAL: 40 marks**

**PRACTICAL ASSESSMENT TASK**  
**PAPER 3.4**  
**TIME: 2 ½ HOUR (1 HOUR 15 min. PER QUESTION)**

This question paper consists of **FOUR** pages (excluding the **2024** grade 10, FS DoE, EGD, PAT guidelines (p 1 – 10)).

To be able to answer this question paper you must receive the following documents from your EGD teacher:

1. The **2024** grade 10, FS DoE, EGD, PAT guidelines (p 1 – 10).
2. All your answer sets as you have answered so far. Without your prepared pages, research and freehand drawings, you cannot answer the question paper any further.

**INSTRUCTIONS AND INFORMATION**

1. This paper forms part of the May/June, IGO paper (3). Learners should note that parts of the questions that will be asked in May/June's 1 ½-hour examination can be completed by pupils ahead of time in order to shorten the 1 ½-hour paper. It is therefore advisable to complete parts of the PAT before the June exam during class periods.
2. Answering this Practical Assessment Task (PAT), is mandatory for the final promotion mark for all EGD candidates and counts 25% (100 points) of the year mark at the end of the year.
3. The PAT (P3) exam is not a clinical exam, as the teacher's intervention is constantly needed for the success of the PAT. It is therefore important that EGD teachers are present during PAT supervision to answer content-related questions raised by the learners.
4. The answer to this question must be a continuation of the already completed design assignment, research and freehand sketches.
5. All drawings must be answered on the already prepared A3 drawing sheets (see exam 3.1).
6. It would be advisable to use the full SANS mechanical name block for the orthographic views.
7. Time planning is essential to complete all the questions during this phase.
8. All answers must be answered correctly and accurately.
9. Pupils can decide between instrument drawings and/or ROT/CAD (computer-aided drawings).
10. One working drawing must be completed with a pencil and drawing tools and the other can be completed with a ROT/CAD program.
11. Schools that do not have ROT/'CAD' facilities must prepare all the required working drawings and pictorial drawings using a pencil and drawing tools.
12. EGD drawing principles, drawing symbols, the title panel (formal or informal), graphic symbols and representations must, regardless of the drawing method used, still comply with the guidelines, as contained in the SANS 10111.
13. Carefully plan each drawing to show complete information on the specific diagram sheet.
14. The PAT will be assessed according to the assessment criteria and a checklist, which is included in the PAT document.
15. Monitor your progress by entering the date on which this drawing is completed in the "date completed column" of your management plan.
16. Untidy and incomplete work, as well as the late submission of the various phases, will be penalised.
17. NO drawing, research or complete PAT's mark will be accepted if your name and surname are not written on it in ink.

**Phase 2**  
**Question 1:**  
**ASSEMBLED DRAWING (MECHANICAL PAT)**

Use your already prepared complete mechanical title block (see the NSC-IGO Paper 2 analytical question as an example).

Using the selected designed tool, you selected during the first phase, present a set of working drawings. Draw, to a suitable scale and in third-angle orthographic projection, an ASSEMBLY DRAWING of the tool, showing clearly all the parts.

**NOTE:** If the tool is too long or too high, break lines can be used to shorten the length/height of the tool in the assembly drawing, so that as large a scale as possible can be used.

The assembly drawing must show the following FOUR views:

- The FRONT VIEW
- A second PRIMARY VIEW (top view)
- Any other SECONDARY VIEW (left view or right view).

**NOTE:** TWO of the views must be sectioned or contain types of sections.

Include the following:

- Titles, labels and notes
- The scale of the drawing
- Detailed dimensions
- Cutting plane(s)
- ALL hatching details
- Hidden details that provide more clarity
- Projection symbol

Use the mechanical assessment criteria and checklist below to ensure you meet all the specifications before submitting the submission drawing.

| <b>MECHANICAL PAT (FRONT VIEW) – ASSESSMENT CRITERIA</b>  |           |
|---|-----------|
| All parts are shown   | 1         |
| Dimensions shown  | 1         |
| Section line correctly placed or part section on handle correctly shown                             | 2         |
| Section line arrow direction correct, or SANS compliant hatching detail shown correct on this view. | 1         |
| Notes and labels added  | 1         |
| The title and scale indicated   | 2         |
| An interrupted view shown on handle   | 2         |
| <b>TOTAL</b>  | <b>10</b> |

| <b>MECHANICAL PAT - PRIMARY VIEWS (TOP VIEW) – ASSESSMENT CRITERIA</b>           |           |
|--|-----------|
| View placed in Third-Angle Orthographic Projection (T.A.O.P.)                    | 2         |
| All parts are shown  | 1         |
| Dimensions shown   | 1         |
| Section line correctly placed, or part section correctly shown                   | 2         |
| Section line arrow direction correct, or SANS compliant hatching shown correctly | 2         |
| An interrupted view shown on handle  | 2         |
| <b>TOTAL</b>   | <b>10</b> |

| <b>MECHANICAL PAT - A SECONDARY VIEWS (LEFT VIEW OR RIGHT VIEW) – ASSESSMENT CRITERIA</b> |           |
|---|-----------|
| View placed in Third-Angle Orthographic Projection (T.A.O.P.)                             | 2         |
| All parts are shown   | 1         |
| Dimensions shown  | 1         |
| Section line correctly placed, or part section correctly shown                            | 2         |
| Section line arrow direction correct, or SANS compliant hatching shown correctly          | 2         |
| An interrupted view shown on handle   | 2         |
| <b>TOTAAL</b>   | <b>10</b> |

**Question 2:  
 ISOMETRIC DRAWING (MECHANICAL PAT)**

Use one of the already prepared **A3** drawing sheets with a 10 mm border line, a simple name block of 75 mm x 20 mm and only your initials, surname (write with a pen) and grade written between 4 mm guidelines. Draw, to a suitable scale, a detailed ISOMETRIC DRAWING of the tool.

Evidence of the following must be included:

- ALL auxiliary views and constructions used to produce the drawing.
- The drawing must have an appropriate grade 10 level of complexity.

**NOTE:**

- The handle of the tool can be changed from a circular shape to a square/hexagonal shape (draw of circles only to be explained in grade 11).
- A printout of your isometric drawing must be used for the front page of your PAT. You can better emphasize your PAT's cover with artistic features (colour, shadow lines, etc.).

Use the mechanical assessment criteria and checklist below to ensure you meet all the specifications before submitting the submission drawing.

| <b>MECHANICAL PAT – ISOMETRIC DRAWING – ASSESSMENT CRITERIA</b>                 |           |
|---|-----------|
| Isometric construction principles and methods applied correct (30° - 90° - 30°) | 1         |
| Show all auxiliary views, construction lines and non-isometric lines            | 1         |
| Correct orientation of the isometric drawing according to the drawn views       | 1         |
| Correct scale used to maximise the isometric drawing on the A3 page             | 1         |
| Isometric answer drawn correct.   | 6         |
| <b>TOTAL</b>  | <b>10</b> |

**{40}**

**Phase 3  
 SUBMISSION OF THE FINAL PAT (EXAM PAPER 3)**

Use the mechanical assessment criteria and checklist below to ensure you meet all the specifications before submitting the submission drawing.

| <b>MECHANICAL PAT – CONTINUOUS SELF-EVALUATION and MEETING DEADLINES – ASSESSMENT CRITERIA</b> |                      |           |
|--|----------------------|-----------|
| Completing management plan dates (see “Date Completed column”)                                 | (mark out of 10 ÷ 2) | 5         |
| The meeting of ALL the submission deadlines  | (mark out of 10 ÷ 2) | 5         |
| <b>TOTAL</b>   |                      | <b>10</b> |

| MECHANICAL PAT – FREEHAND DRAWINGS – ASSESSMENT CRITERIA  |           |
|---|-----------|
| Freehand drawing methods and skills (Grid page included)  | 10        |
| Neatness (2) + correct line types used (2) + line consistency (2) + printing (2) + dimensioning (2) | 10        |
| <b>TOTAL</b>  | <b>20</b> |

| MECHANICAL INSTRUMENT DRAWINGS – ASSESSMENT CRITERIA  |           |
|---|-----------|
| Use of drawing instruments, drawing methods and skills  | 10        |
| Neatness (2) + correct line types used (2) + line consistency (2) + printing (2) + dimensioning (2) | 10        |
| <b>TOTAL</b>  | <b>20</b> |

| MECHANICAL PAT – CAD-DRAWINGS – ASSESSMENT CRITERIA |           |
|---|-----------|
| Competence displayed in using a CAD program         | 10        |
| Layout and correctness of the drawing presentation  | 10        |
| <b>TOTAL</b>  | <b>20</b> |

Submit your PAT in the following (final) sequence:

1. The final cover with a copy of your two-point perspective drawing added.
2. The final table of contents with all the page numbers filled in.
3. The summative assessment sheet.
4. The completed declaration of authenticity.
5. The design brief with the management plan dates in the "Date Completed column" filled in on it.
6. The **four, A4** or **two, A3** pages per subject, of research.
7. The bibliography of the research.
8. The **first** of two, **A3** page for the freehand drawings of the possible design solutions.
9. The **second** of two, **A3** page for the freehand drawings of the possible design solutions.
10. All the documents used to choose the best solution.
11. A complete mechanical SANS 10111 name block with the orthographic drawings (three views).
12. The isometric drawing (mechanical PAT).
13. The assessment criteria with the checklist filled in.
14. The grid page for drawing the two freehand sketches.

| MECHANICAL PAT – PRESENTATION OF THE COMPLETE PAT – ASSESSMET CRITERIA                      |           |
|---|-----------|
| Develop your own designed front page (copy isometric drawing add initials, surname & grade) | 2         |
| Prepare the final Index with page references  | 2         |
| Summative assessment sheet and declaration added  | 2         |
| The presentation requirements of this document is filed in the correct sequencing           | 2         |
| The present the final presentation in a file format.  | 2         |
| <b>TOTAL</b>  | <b>10</b> |

**TOTAL 100**