EXAMINATIONS AND ASSESSMENT CHIEF DIRECTORATE
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2024 NSC CHIEF MARKER'S REPORT

SUBJECT	**GRDS (ENGINEERING GRAPHICS & DESIGN)**	
QUESTION PAPER	**1**	
DURATION OF QUESTION PAPER	**3**	**HOURS**
PROVINCE	**EASTERN CAPE**	
NAME OF THE INTERNAL MODERATOR	**RP OLIVIER**	
NAME OF THE CHIEF MARKER	**B CRONJE**	
DATES OF MARKING	**2 – 12 DECEMBER 2024**	
HEAD OF EXAMINATION:	**MR E MABONA**	

SECTION 1: (General overview of Candidates Performance in the question paper as a whole)

The majority of learners performed poorly, although it the results seems to be better than last year. The lower order of the paper was attempted by all learners. The middle and higher order questions were poorly answered or not attempted at all. The learners focus more on question 1 and 4, then question 3 and 2

SECTION 2: Comment on candidates' performance in individual questions

QUESTION 1:

(a) General comment on the performance of candidates in the specific question. Was the question well answered or poorly answered?

Question 1 (Civil Analytical) - 30 marks (15%)

Most learners managed to answer lower-order questions successfully, they struggled with analytical (higher-order) questions.

- A significant number of learners were limited to basic understanding and struggled with higher-order thinking.
- Only a small fraction of learners scored in the upper range (18-30 marks), indicating that learners do not yet understand this part of the work well.

Average mark obtained was **12.3 (41%)**

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.

Question 1

The difficulty levels of the questions were fair, and learners were familiar with the format, as it was consistent with previous years.

- Questions 1.1 - 1.8 & 1.12: Were particularly straight forward, with answers clearly identifiable on the paper.
- Questions 1.9 - 1.14 & 1.16: Were reasonable, assessing symbols and theoretical knowledge that have been tested in the past.
- Questions 1.17, 1.18,& 1.20: Were also reasonable, but most learners found them challenging.

Sections posed particular difficulties for learners. :

- Questions 1.6, 1.9, & 1.1 Learners struggled with converting millimeters to meters.
- Question 1.16: Learners struggle with determining directions like north east despite the presence of a north symbol.
- Question 1.18: Required learners to draw the graphical symbols for a bidet and a dimmer switch, which they found challenging.
- Questions 1.19 & 1.20: Which involved calculating perimeter and area, remained problematic despite being standard questions included in assessments annually

(c) Provide suggestions for improvement in relation to Teaching and Learning.

Question 1.

Critical steps to reinforce skills in analyzing site plans and title blocks effectively:

- Create a termly schedule to revisit these questions in class and tests.
- Use different examples to ensure a variety of scenarios.
- Regularly reference SANS documents and textbooks in lessons.
- Develop a checklist of common symbols and terminologies for learners to memorize and use.
- Train learners on how to use the exam reading time effectively.

Work through papers as group activities to encourage peer learning.

(d) Describe any other specific observations relating to responses of candidates and comments that are useful to teachers, subject advisors, teacher development etc.

Question 1

Focus on neat presentation is a great way to instill discipline and precision in learners. It appears that candidates often leave question 1 until the end of the session, which can result in running out of time and rushing through the questions, leading to unnecessarily mistakes. Effective time management is crucial when completing this question paper.Here are a few strategies to reinforce these practices:

- Include activities where students focus on converting units, writing formulas, and solving in a step-by-step manner.
- Evaluate their work based on both accuracy and neatness to encourage consistent habits.
- Display examples of well-organized answers alongside poorly presented ones to highlight the importance of clear presentation.
- Conduct short drills on neat freehand drawing, emphasizing proportionality and clarity. Starting in gr. 10.

- Use diagrams and labeling exercises to remind students of the layout conventions for first-angle projections.

Converting millimeters to meters and meters to millimeters.

QUESTION 2

(a) General comment on the performance of Candidates in the specific question. Was the question well answered or poorly answered?

Question 2. (Solid Geometry) -38 marks (19%)

This performance analysis shows that most learners struggled with this question, particularly with the sectional left view, while performing slightly better with the given views. The low average score indicates a significant gap in understanding content and skill.

- Many candidates limited themselves to replicating the given views without attempting the sectional left view.
- Possible lack of insight or confidence with sectional solids geometrical drawings.
- Only a few high-performing learners could complete the question, suggesting that the concept of sectional solids is not well understood or practiced.

Average mark obtained was **10.3 (27%)**.

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.

Question 2.

Learners constructed irregular hexagons with uneven sides or incorrect angles, leading to incorrect alignments with the square prism. Some candidates attempted to draw an approximate shape rather than constructing it geometrically. The height lines of the square prism was often not perpendicular with the side of the pyramid. It clearly indicates that there is a significant gap in skill to draw perpenducular lines. Learners also did not hatched the two solids in opposite directions.

(c) Provide suggestions for improvement in relation to Teaching and Learning.

Question 2.

Since the question about solids remains challenging year after year, focusing on a few key strategies could help students:

- Teachers are required to follow the guidelines set out in the CAPS document. CAPS emphasizes that learners must build on prior knowledge. This means that work covered in Grade 10 and 11 should be revisited and consolidated in Grade 12
- In Grade 10, ensure learners fully understand the basics of drawing individual solids. This will set a strong foundation for more complex tasks in later grades. This question in the paper combines two Grade 10 drawings.Once they are comfortable with individual solids, introduce combining them step by step. Start with simpler combinations before progressing to more complex ones.
- Incorporating practice exams regularly into the curriculum will allow learners to familiarize themselves with various questions and scenarios, building their confidence.
- In Grade 12, revisit the work from earlier grades, focusing on areas where learners typically struggle. This could be through targeted revision sessions, extra exercises.

- As this question can be time-consuming, practicing with a time limit can help learners improve their efficiency and reduce the pressure during exams.

(d)Describe any other specific observations relating to responses of candidates and comments that are useful to teachers, subject advisors, teacher development etc.

Question 2

- It's clear that the challenge with drawing geometric shapes, like the hexagon and square at an angle, requires both conceptual understanding and practical skill. To help learners improve, here are a few specific strategies you can use:
- Teach learners to recognize relationships between the shapes they are drawing. For example, understanding how the angles of the hexagon and square relate to each other when placed at an angle will help them visualize the solution more clearly. Learners find it difficult to draw perpendicular lines.
- Ensure that learners understand the importance of planning the space before starting their drawing.
- Have learners practice constructing these shapes at various angles, not just the ones they encounter in exams. This will make them more adaptable to any situation during the test.
- Since this question tends to be time-consuming, incorporating timed practice sessions will help learners learn to manage their time more effectively and ensure they don't leave questions incomplete.

QUESTION 3

a) General comment on the performance of candidates in the specific question. Was the question well answered or poorly answered?

Question 3 (Perspective) - 40 marks (20%)

It's clear that while most learners grasped the foundational elements of perspective drawing, such as positioning vanishing points (VPs), they faced challenges when it came to more intricate aspects like constructing curves (such as the circle) and handling detailed features like the dormer window and the roof.

Average mark obtained was **9.6 (24%**)

(b)Why was the question poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.

Question 3

A key issue is that candidates understood how to show the construction of the the circle in the top view but struggled to bring it down to the side view. Learners need to utilize height lines more effectively, particularly when lines and points in the top view are not perpendicular or aligned at 45° or 30°/60°. To address this:

- Emphasize the importance of projecting points from one view to another. When constructing circles.
- Show them how to identify and mark points systematically, which will help in the perspective drawing.
- The dormer window can be tricky due to its protruding structure and positioning. Break the process into manageable steps.
- Let the learners first draw the basic A-frame structure of the roof. Then, teach them to draw the dormer window by constructing it in smaller parts—begin with the basic shape, then add details like the reveals.
- Emphasize the use of projection lines to ensure the dormer is placed accurately in relation to the rest of the roof and walls. Practice projecting the dormer's position from the top view into the side and front views.
- One challenge that learners face is determining the correct heights for windows, doors, and the roof. Encourage the use of height (reference) lines.
- Given the complexity of these drawings, learners will need consistent practice. Provide feedback after each exercise to identify and correct specific errors, especially in areas like projection lines, height determination, and curve construction.

(c) Provide suggestions for improvement in relation to Teaching and Learning

Question 3

Incorporate perspective drawing exercises into the revision plan each term. These should build in complexity over time, starting with basic perspective techniques and advancing to more complex scenes.

- Old exam papers are a great way to identify recurring types of questions. Encourage learners to work through past exam papers and time themselves to simulate exam conditions.

After completing practice papers, review common mistakes as a class or in small groups, helping learning understand where they went wrong and how to improve. This will also help them become familiar with the types of questions they will face.

(d)Describe any other specific observations relating to responses of candidates and comments that are useful to teachers, subject advisors, teacher development etc.

Question 3

Learners struggle to apply the correct line types, particularly in distinguishing between visible outlines and construction lines. A frequent error is using the same line weight for both, which may lead to confusion for the marker. Maintaining a clear and consistent distinction between these lines is crucial for clarity in isometric drawings.

- Challenges particularly with the horizon line (HL) placement, vanishing points (VP), and perspective circles, can be addressed through focused practice and targeted strategies:
- Height lines are essential in perspective drawing to maintain proportionality and verticality. Ensure that learners understand how to project these lines from the top view to the perspective view.
- A circle in perspective becomes an ellipse. Teach learners how to draw ellipses by projecting points from the circle's circumference and using the vanishing point to define the major and minor axes.
- Set up focused exercises where learners must practice drawing objects at various heights and orientations, ensuring they are correctly using the horizon line, selecting the right vanishing points, and constructing accurate perspective circles.

Implement timed exercises to help learners become efficient at constructing perspective drawings and applying all the necessary techniques under time constraints.

QUESTION 4

(a) General comment on the performance of candidates in the specific question. Was the question well answered or poorly answered

Question 4 (Civil) - 92 marks (46%)

This question caters to learners across different performance levels (both below and above average), highlighting the importance of including balanced questions that encourage broad participation.

Some learners did not answer all three components of this question, leaving the more complex parts of the views unanswered:

- Learners might not have allocated enough time to this question.
- Some learners did not read the question in full, which might explain why they omitted the hatching and labels.
- Certain components may have been more challenging, leading to incomplete answers.

Average mark obtained was **49.7 (54%)**

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by candidates in this question, and any misconceptions.

Question 4

These observations highlight the need for continuous reinforcement of foundational skills from earlier grades. It's essential to integrate these concepts into Grade 12 practice to bridge the gap.

- Regularly revisit sanitary fixtures, electrical symbols, window and door sizes, using simple tasks that build confidence and accuracy.
- Provide step-by-step exercises on projecting elements from the floor plan to the elevation.
- Break roof construction into smaller components (e.g., purlins and branderings) for targeted practice before integrating them into complete drawings.
- Create comparative examples of "correct" and "incorrect" roof drawings to help learners visualize errors.
- Identify the components most often left unanswered in tests and examinations, and provide focused practice to strengthen understanding in those areas.

- Use physical models or 3D visual aids to explain roof construction concepts.
- Encourage learners to analyze sectional views in real-life examples or photos of buildings.
- Motivate learners to attempt every part of a question, even if they feel unsure, as partial credit is often awarded

(c) Provide suggestions for improvement in relation to Teaching and Learning.

Question 4

The emphasis on roof construction and accuracy in details such as scales, symbols, and break lines is crucial for success in civil exam papers. Additionally, learners need to read instructions thoroughly to avoid missing key details.

Possible strategies to help learners improve:

- Use mock exercises dedicated to constructing roof components with accurate dimensions and proper placement.
- Include tasks requiring candidates to measure dimensions in one scale and adapt them to another. Real-world examples or floor plans can make these exercises more practical and engaging.
- Train learners to consistently extend lines to the break line through repetitive exercises and regular feedback.
- Provide annotated examples of common mistakes to help learners understand and reinforce correct methods.
- Emphasize the importance of reading questions in full to ensure learners do not overlook simpler tasks, such as adding hatching or labels, which can secure easy marks.

By integrating these strategies into lessons, learners will develop greater precision, confidence, and attentiveness when tackling roof construction questions.

(d) Describe any other specific observations relating to responses of candidates and comments that are useful to teachers, subject advisors, teacher development etc.

Question 4

Effective time management during exams is essential, with a target of earning approximately 1½ marks per minute. Candidates should prioritize this question in their time planning, as it accounts for 46% of the total exam marks. Allocating an average of 83 - 85 minutes to draw the 92-mark question can significantly enhance the chances of completing it and achieving maximum marks.

- Incorporate timed drawing exercises that simulate exam conditions to build speed and confidence.
- Teach learners to prioritize accuracy in initial steps to minimize corrections later.

- Provide targeted exercises on drawing less common elements, like doors and windows at angles and door frames.
- Create worksheets focused on identifying, drawing, and applying graphical symbols correctly.
- Reinforce the significance of different line types (e.g., solid, dashed,lines) through through practical examples. The line work of many learners does not meet the required standard.
- Use past exam papers with similar layouts to familiarize learners with the format and expectations.