

EXAMINATIONS AND ASSESSMENT CHIEF DIRECTORATE

Home of Examinations and Assessment, Zone 6, Zwelitsha, 5600

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2024 NSC CHIEF MARKER'S REPORT

SUBJECT	Engineering Graphics and Design		
QUESTION PAPER		2	
DURATION OF QUESTION PAPER	3 hours		
PROVINCE	EASTERN CAPE		
NAME OF THE INTERNAL MODERATOR	Mrs N de Bruin		
NAME OF THE CHIEF MARKER	Mr C van Huyssteen		
DATES OF MARKING	1 – 12 December		
HEAD OF EXAMINATION:	MR E MABONA		

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

The overall performance of the candidates was shocking. In some centres, certain questions were poorly answered or just left out completely. Simple copy work was poorly done and even left out at times. The amount of "0" marks for a question has increased. In some cases, candidates even score "0" marks in two of the questions, because they did not even attempt the questions.

SECTION 2: Comment on candidates' performance in individual questions

The examination paper was a fair and well-balanced and also compared well with past examination papers. Candidates still do not perform well.

Question 1 which consists of content that is simple and can be studied ahead of time, was still poorly answered. This question should be simple to answer as questions are often very similar to what was asked in previous years. 50% of the analytical questions were asked in the past 3 years but still it is poorly answered. Question 2 was divided into two questions to cover a wider scope of the Curriculum, a Loci Mechanism and a Loci Cam. The Mechanism had a single Loci that the candidates had to determine, and the Cam tested the

construction of the Displacement Graph. Most candidates attempted the Mechanism, while many only were able to complete the given which is lower order knowledge. Most candidates attempted the Cam but struggled with the Harmonic and Acceleration and retardation motions of the graph, which is the middle to higher order difficulty levels.

Question 3 consisted of an Isometric drawing as in previous papers. The question was fairly well answered with some candidates obtaining very good marks. There are still candidates who do not even attempt this question. The construction of the Pentagon (Grade 10 & 11), and the Circle (Grade 10 & 11) were main problem areas for the candidates. Candidates also struggled with the placement of the backend block, many placed it in front.

Question 4 consisted of a Mechanical Assembly drawing as in previous papers. This question was poorly answered. Most candidates did not draw the right view which was a copying exercise and seen as the lower order part of the question. Some candidates did not section the front view. Many of the candidates that did section did not understand how to half section. Candidates did not use the Exploded Isometric view to help them understand the assembly of how the parts fit into each other.

The examination did not have any choice questions.

In my opinion, it was a fair exam and candidates who prepared well for the exam could score good marks.

QUESTION 1

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

The analytical questions were poorly answered, with very few candidates scoring any marks in the middle to higher order questions. Candidates do not spend enough time practicing analytical questions throughout the year. Most of these questions are repetitive, if learners spent time going through previous years questions, they should easily be able to obtain good marks for this question.

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

Teachers must make use of the SANS and DBE approved textbooks to obtain the correct terminology for the subject. Make use of old/previous years exam papers that are available on the DBE website, to learn the different terminologies that the candidates need to understand and be familiar with.

Exercises in the reading of drawings must be done to improve the candidate's ability to locate and calculate dimensions.

Teachers must make use of old examination papers to guide candidates in how to answer an analytical question.

Candidates must answer questions correctly and follow the instructions given, e.g. if the question states that the symbols must be drawn in freehand, then it must be freehand. The opposite is also true, if instruments are required then freehand drawings will not be accepted.

Time management is essential to complete all the questions in the exam paper. The reading time given should be used to read through the analytical question. Candidates need to work under time constraints as to improve their drawing speed.

Make use of old mechanical parts / models and use them as examples for their learners to understand the different components and their working drawings. Learners can use these models and disassemble the parts and put them back together so as to learn how they should fit into each other.

This is the type of question that you should allow learners to take home and do research on to find answers. Let the class discuss their findings and decide which answer is the correct one and explain why.

To get candidates to learn where the different views must be placed in the third angle orthographic projection, let them print the names of the views under each drawing they do in the classroom.

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

It seems to be that candidates leave question 1 for the end of the session which means that they sometimes run out of time and must rush through the questions and then make mistakes. Time management is very important when completing this question paper.

The responses from candidates indicate that many of them do not understand the terminology and language used in the question. The answers show that they do not know what is being asked for example when asked for dimensions they answer with names of parts of the assembly etc. The lack of knowledge of technical terminology is a factor in the ability of candidates to answer questions.

This type of question should be asked in grade 10 so learners can start to develop skills in these questions as well as reading drawings.

Many of the questions in this section can be found in previous exam papers. This shows that teachers do not consult past papers when planning lessons.

Learners are often not interested in learning the basic skills taught from grade 10.

QUESTION 2 (Summary)

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

Most candidates did poorly in this question, even though many candidates attempted the question they are only able to answer the lower order parts. Very few candidates could obtain a mark of 80% and above.

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

2.1) Candidates did not copy the given schematic of the mechanism accurately. Candidates did not understand the movement of the rocker oscillating around point C. Candidates struggled to do the simple math by subtracting the 60mm from the total length of 120mm to determine the length of AD.

2.2) This question was attempted with more success, there are still many candidates that swap the motions of simple harmonic and acceleration and retardation. Many are only able to do simple harmonic and then repeat this motion, costing them marks. Candidates did not divide the horizontal and vertical distances into 6 equal parts to determine the movement on the graph. Candidates in most cases do not label the graph.

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

Teachers must teach according to the CAPS document. Work that was done in grade 10 & 11 must be revised in grade 12.

Dividing circles into equal parts must be practiced more regularly.

Teachers need to explain the terminology that is used in practice questions to describe the movement of a mechanism, e.g., oscillates, sliding, reciprocate, pivot, pin-jointed, crank, swivel guide, etc.

Learners need to practice the dividing of vertical and horizontal lines into equal parts. Teachers must explain that when determining the movement UAR they need to divide the rotational and displacement lines into at least 6 equal parts.

Learners need to have proper drawing instruments to be able to draw accurately
(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.
Candidates must read the questions carefully to avoid drawing the wrong movements on the displacement graph. Freehand drawing of smooth/even curves through specific points needs to be practiced in the classroom.
QUESTION 3
(a) General comment on the performance of candidates in the specific question. Was the question well answered or poorly answered?
Some centres did well in this question, however there are still many that perform poorly
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
<p>Many candidates still have problems mastering the following areas of this question:</p> <ul style="list-style-type: none"> • Constructing of an auxiliary view and then also using that said auxiliary view correctly in the drawing of the question. (pentagon) • Drawing of the isometric circle is also problematic, many do not attempt it or just draw it freehand with no construction, and centre lines are in most cases just left out. • The candidates still struggle to draw the pentagon in isometric. <p>Candidates do not try to draw neatly and then lose many marks due to this, because there is no distinction between construction lines and outlines.</p> <p>Drawing accurately is a huge concern in this question</p> <p>Many candidates still cannot convert to 2D into 3D in a drawing and as a result they can not achieve many marks in isometric.</p>
(c) Provide suggestions for improvement in relation to Teaching and Learning
<p>Learners need to practice how to convert from 2D to 3D. Make use of models that you can use to assist learners to visualise the 3D form in isometric. When learners are able to see it they can better draw it.</p> <p>More attention should be given to the following aspects of isometric drawings:</p> <ul style="list-style-type: none"> • Visibility of the lines, line quality is very poor

- Candidates are struggling to master the method of constructing a circle in isometric. Compass work is poor.
- Centre lines must be practiced and drawn correctly

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

Most candidates fail to apply the correct line type, visible outlines compared to construction lines.

Educators should guide candidates on how to draw precise 30 ° lines of isometric drawings, using the correct scale and given dimensions.

Proper instruments must be used and checked regularly

Isometric drawings need to be practiced in all grades

QUESTION 4

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

Most candidates attempted this question. The question was not well answered.

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

Planning and placement of views in third angle orthographic is critical.

Candidates do not measure properly and therefore drew incorrectly.

Incorrect placement of parts of the assembly.

Some candidates did not use proper instruments.

Centre lines are a big problem most learners do not draw them correctly/accurately, and as a result centre lines are not SANS compliant and cannot be awarded marks.

Very few learners can construct the nut correctly.

Candidates sometimes use civil hatching, hatch at the wrong angle, do not change direction of hatching to distinguish different parts, and hatch through solid lines on a part. These result in penalties.

Parts of the assembly were drawn as unassembled.

Proper instruments should be used and checked regularly

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

More attention should be paid to drawing in third angle orthographic. Teachers need to place emphasis on the exploded isometric view given in the assembly question, this should guide the learners as to how to assemble the drawing.

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

Managing time effectively during exams is crucial. Aiming at 1,5 marks per minute. Candidates need to prioritize this question in the planning of their time as it consists of 46% of the total marks of the exam paper. Managing time will increase the chances of finishing the question and scoring maximum marks. Roughly 83 minutes should be spent on 92 marks.

Reinforce the significance of different line types. Sharp clean lines must be used to accurately represent the shapes, edges, and boundaries of parts.

Proper planning of the placement of views is essential in 3rd angle orthographic projection. Special attention needs to be paid to this in the teaching process.

While preparing learners, to answer assemblies, special attention must be given to sectioning of different components and sectioning rules.

Line types and their use must be stressed.