



Province of the
EASTERN CAPE
 EDUCATION

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CHIEF MARKERS REPORT

INSTRUCTIONS

1. The Chief Markers are required to complete this report during the marking session. The aim of the report is to provide a feed back and to help subject advisors and educators to improve the teaching and learning.
2. The report should be informed by discussions between the **Chief Marker, moderator, senior markers and markers** of the particular subject. **NB: There should be one report per subject per paper.**
3. The report must be detailed, informative and question by question performance of the candidates.
4. Reference may be made to the topics identified below as well as any aspect the Examiner wishes to bring to the attention of the subject advisors and educators.
5. **The report must be submitted in hard copy and an electronic version to the centre manager at the marking centre.**
6. The centre managers then forward the report to the Directorate of Assessment and Examination (Att: Mr. V A Joseph) in King William's Town.

SUBJECT:	ENGINEERING GRAPHICS AND DESIGN
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GRADE:	12	PAPER:	2
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DATE OF EXAMINATION:	4 December 2009	DURATION:	3 HRS
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1. **STANDARD OF THE QUESTION PAPER. Was the paper of an appropriate standard for Grade 12? Substantiate**

Yes. When compared to the competency descriptors in the NCS document the paper measured skills, knowledge and understanding of the LO's, ASS's, and the relevant content for the grade 12 level descriptors and competency descriptors.

2. **COVERAGE OF NATIONAL CURRICULUM STATEMENT.** Does the paper cover the prescribed Learning Outcomes and Assessment Standards? If your answer is no, indicate which Learning Outcomes or Assessment Standards were not adequately covered?

Yes.

LO 1 is covered in question 1, though not very high extent.

LO 2 is covered by the PAT.

LO 3 is covered by all questions.

LO 4 is covered by all questions.

3. **UNFAIR QUESTIONS:** Were there any questions that were either inaccurate, ambiguous, outside the NSC or beyond the level of Grade 12. List these questions, with motivation.

No unfair questions

4. **LANGUAGE.** Is the language used appropriate for Grade 12 candidates? List questions that were linguistically complex and show how these questions can be re-phrased.

In question 1 Some responses indicated that the word "checked" was confused with "changed", "changed" could be replaced by "updated" or "REVISED". Afrikaans 13: "Bepaal die volgende afmetings:..." could rather read: "Lees die volgende afmetings vanaf die aansigte" In question 4 "All drawings must comply with the guidelines contained in SABS 0111" suggest to read "All drawings must comply with the guidelines and conventions contained in SABS 0111". A point of origin for the front view, even if only a center line will guide the candidates to place the views correctly in Q4. In Q4 the Third Angle projection symbol should have been indicated or it should have been written in the text.

5. **LENGTH OF QUESTION PAPER.** Were candidates able to complete the question paper in the stipulated time?

Yes, a well prepared candidate could complete the paper with ease.

6. **MARKING GUIDELINE.** Does the marking guideline cater for all alternative responses?

No, the guideline is rigid due to the nature of the subject. Although the following concessions are allowed.

Q1: 11 to 13 - Symbols such as M; \emptyset are not essential, candidate should be encouraged to add symbols.

14 - Can also be section plane. Centre line is not acceptable

15 - Dimension is the essential word

18 - Anything drawn in freehand 1 mark must be allocated

Q2: If figure 1 is drawn correctly instead of figure 2 5 marks for given

must still be allocated

If only 8 intervals are used on each circle all the marks for constructions can be allocated. Marks can be lost on the correctness of the curves.

Only the accuracy of the curves must be assessed not the quality, this means that freehand drawn curves are acceptable but should not be encouraged.

Q3: If drawing is not drawn at 30° (not isometric) marks can be allocated for vertical lines and non isometric lines ONLY.

Marks may also be allocated for the auxiliary view, orientation, center lines and the hatching.

Wrong orientation: Loose marks for orientation to B.

Only the visible parts (lines) of the correct memorandum answer that are visible in the wrongly orientated answer may be allocated the marks as indicated on the correct memorandum answer.

Hatching 1 mark for the area and 1 mark for correct application.

If isometric circle stencils are used and no constructions are not shown the 5 marks for construction are lost, the 7 marks for the circles must still be allocated.

Q4: If drawn to incorrect scale -2 marks

If the right view is not sectioned/ hatched marks must be allocated for all outlines that are correct according to the correct memorandum allocated marks.

For each part that has been incorrectly hatched the same as any other part, $\frac{1}{2}$ mark must be subtracted.

Nut (7) if there is no evidence of construction -1 mark

Assembly 1 mark for every part correctly assembled. If the assembly is incorrect, use the part that with the most other correctly assembled parts.

7. ANALYSIS OF QUESTION BY QUESTION PERFORMANCE OF THE CANDIDATES

Give a detailed account of how the candidates performed in each question. In doing this, the following steps should be followed:

- 7.1 The aim/objective for setting the question (what skills, knowledge, values and attitudes were being tested by asking the question)
- 7.2 Relevance or relation of the question to the Los and ASs.
- 7.3 How did the candidates perform in the question?
- 7.4 Where and how did candidates lack or fail in giving an appropriate answer to score high marks in the question?

QUESTION 1

Skills:	Analysing data on a drawing; Interpreting data.
Knowledge:	Drawing principles as contained in SANS code of Practice as related to complex Mechanical drawings. Single and multi-view drawing principles: 1st and 3rd angle orthographic projection complex assemblies detail drawings Principles of sectioning: multi-view drawings Single and multi-view drawing principles: limits & fits, tolerances, measurement and surface textures,
The question relates to:	LO 1: ASS 3 LO3: ASS 1, 3,5 LO4: ASS 1, 2, 4, 7
Performance:	Most learners attempted the question. It is evident that learners are not used to answering this question type. The answers were all given in the drawing and the learner had to read the from the information.
Shortcomings of candidates	Candidates do not print the answers. Candidates do not use the information given on the drawings to answer the questions. Candidates do not know the SANS conventions, the learners copied the drawing of the spring and did not draw the convention. Candidates do not know the machining symbols. The skill required is the analysis of the drawing and the information shown. All information could be read of the drawing. No measuring and calculating is needed.

QUESTION 2

Skills:	Analysing written information; Interpreting information, drawing skills
Knowledge:	Drawing principles as contained in SANS code of practice as related to complex Mechanical drawings. Single and multi-view drawing principles: 1st and 3rd angle orthographic projection detail drawings Loci of points on the components of mechanisms.
The question relates to:	LO3: ASS 1, 6 LO 4: ASS 1, 5, 7
Performance:	Very few learners attempted the question and the responses were poor. 40% of the marks for this question could have been obtained by merely copying and construction.
Shortcomings of candidates	Candidates do not indicate the direction that components travel and are lazy to label the intervals of movement. The result is that they do not work in an orderly manner, making this drawing complex. Learners redraw the figure 1 which is not required. Only the diagram must be redrawn and the determine the loci. Candidates use too few intervals to determine the curves. It is suggested the at least 12 intervals are used. Although no marks were deducted for freehand drawing of the curves it should be stressed that candidates use either french curves or flexi curves to draw the curves. Accuracy is very important when drawing the curves.

QUESTION 3.

Skills:	Analysing drawn information; Interpreting information, drawing skills
Knowledge:	Drawing principles as contained in SANS code of practice as related to complex Mechanical drawings. Single and multi-view drawing principles: 1st and 3rd angle orthographic projection detail drawings Pictorial drawings principles: isometric Principles of sectioning: pictorial drawings
The question relates to:	LO3: ASS 1, 4,5 LO 4: ASS 1, 3, 4,7
Performance:	Many learners attempted this question. The responses were very poor, this work has been continually assessed from grade 10. It is evident that the learners do not practice enough.
Shortcomings of candidates	Candidates do not interpret third angle projection drawings correctly, this results in the incorrect placement of the isometric drawing. Very few candidates used auxiliary drawings or constructions to find the dimensions for non isometric components. Centre lines were omitted. When sectioning isometric drawings the candidates do not hatch the planes sectioned in opposing directions. Line quality of border, construction and hatching is not adhered to. The use of stencils does not mean that constructions of isometric circles may be omitted. Isometric drawings are done at an angle of 30° .

QUESTION 4

Skills:	Analysing drawn information; Interpreting information, drawing skills
Knowledge:	Drawing principles as contained in SANS code of practice as related to complex Mechanical drawings. Single and multi-view drawing principles: 1st and 3rd angle orthographic projection detail drawings complex assemblies Pictorial drawings principles: isometric Principles of sectioning: multi-view drawing drawings
The question relates to:	LO3: ASS 1, 2, 3, 5 LO 4: ASS 1, 4, 7
Performance:	Most learner attempted this question. The fact that the question includes a isometric view causes the learners to interpret the drawing well. Even though the responses were poor, the improvement over past papers is visible. More excercises must be dome in class.
Shortcomings of candidates	Candidates do not read the question. They are unsure about the symbols that are used to indicate third angle projection. Basic concepts like construction of nuts and thread detail is lacking. Sectioning conventions as described in SANS O111 are not adhered to. The cutting plane is left out. Simple instructions that are not followed result in the loss of easy marks. Learners do not align the projected views for assembly drawings. The drawings are not neatly placed on the page.

7. ANY ADVICE THAT YOU COULD GIVE TO EDUCATORS IN HELPING THE CANDIDATES TO REACH THE EXPECTED LEVEL.

Question 1: When answering the analytical question the candidates must print the answers in capital letters. When writing dimensions the symbols must be written down as well e.g. $\text{Ø}60$, 213PCD, 107, M12
Free hand sketches must be neat and follow SANS. SANS conventions should be used in drawings, they are designed to save time when drawing standardised component such as springs (Fig 1).

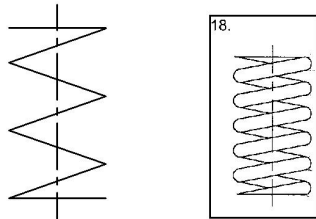


Figure 1

Question 2: Read the questions carefully. Intervals of motion can be labelled to avoid confusion. Pay attention to the direction of travel of the parts, indicate the direction of travel on your drawing. When joining the points of loci the curves must be drawn using french curves or flexi curves - NOT FREE HAND. (Fig 3)

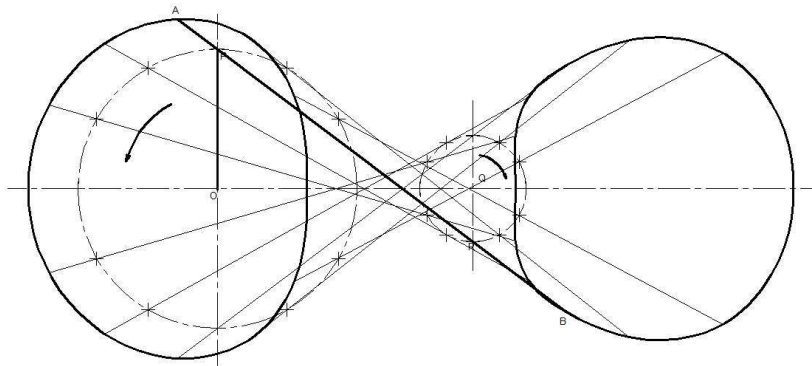


Figure 3

Question 3: Pay attention to placing of isometric drawings. Use blocks to draw isometric drawings. The construction for drawing isometric circles and arcs should not be erased. (Fig 2)

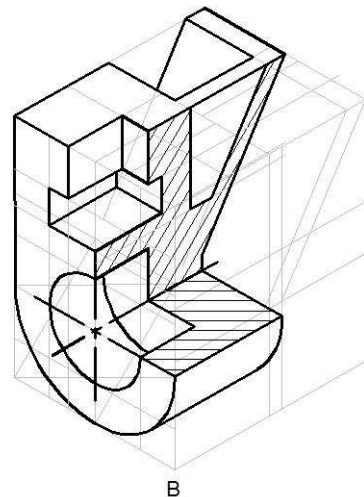


Figure 4

The direction of hatching in quarter sections must be opposing. (Fig 4)

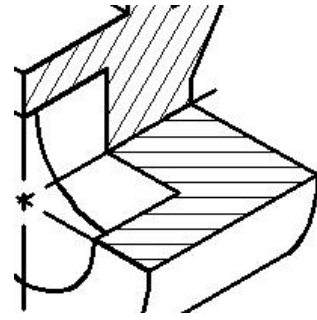


Figure 4

Webs should not be hatched in isometrics or orthographic drawings. (Fig 5)

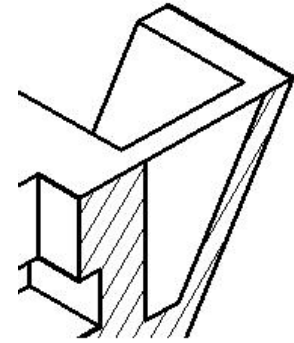


Figure 5

When drawing non isometric components, use an orthographic drawing to find the dimensions. (Fig 6)

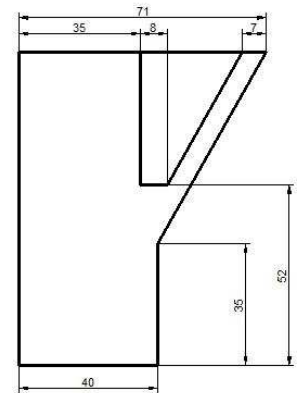


Figure 6

Question 4: Read questions and data very carefully. Determine with which view you will be starting. Begin with the parts that will be closest to the observer. Constructions of nuts bolts and geometric shapes should not be erased. Do not use stencils for nuts. Only when multiple nuts are drawn may stencils be used.

Pay attention to the orthographic system that is being used. Do what the question asks. Tick when you have completed each task.

Pay attention to the ratios used when

drawing nuts and thread details. (Fig 8)

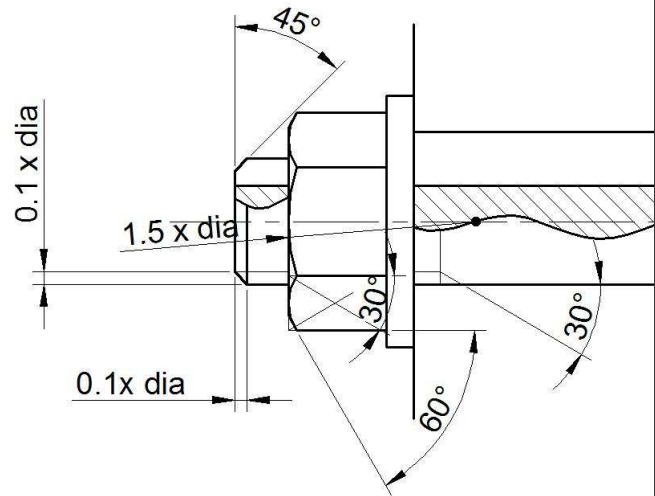


Figure 8

Partial sections should be used on parts that are not normally sectioned or hatched. Pay attention to objects that should not be hatched, such as keys,

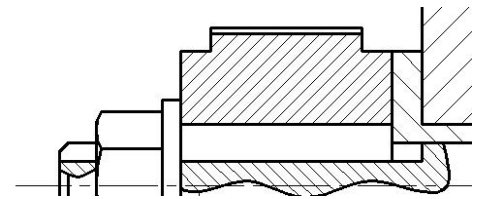


Figure 7

shafts and axles, fasteners, etc. (fig 7)

Centre lines must be added to full and sectioned views. (fig 9)

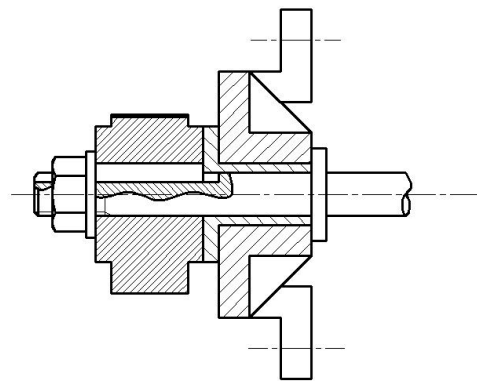
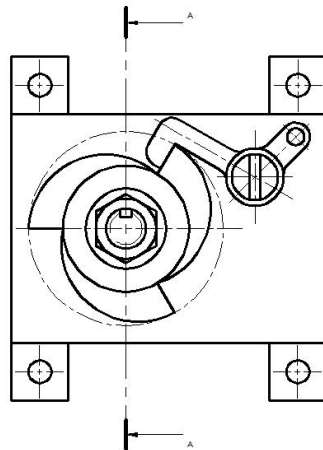


Figure 9

8. ANY OTHER COMMENTS

Draughtmanship:

Use 2H pencils that are sharp, keep the pencil sharp. When erasing use a white eraser that is clean. Make sure that hands are clean and dry to keep the paper clean. Staple the paper in the correct order as per instructions on the first page. Use an HB lead or pencil in the compass to clearly draw circles. Drawing equipment must be cleaned before use. Pay attention to line types and neat drawing, quality of line work benefits the draughtsman. Construction lines must not be erased, because constructions count marks.

Examination skills and technique:

Mark per minute is a guideline for allocating time to answer a question. Calculate as follows: 3hrs x 60min = 180min; 200 marks /180 min = 1.1 mark per minute. The guideline time for Q.1 is 30/1.1 = 27 min; Q.2 33/1.1 = 30min; Q.3 44/1.1 = 40min; Q.4 is 93/1.1 = 84min. Try not to exceed the guideline time, easier questions should answer quicker and this gives more time for complex questions. Answer easier questions first. If you get stuck with a question do not brood over it, continue with a question that you can do. Candidates must practice drawing every day. Give old examination questions (even old Tech draw papers) as class exercises and home work. Grade the questions to find where the problem areas are. If candidate are not able to answer a question they must at least draw the given detail of the question to the dimensions provided.

SIGNATURE OF CHIEF MARKER/MODERATOR: _____



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