



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

ENGINEERING AND DESIGN

EXAMINATION GUIDELINES

GRADE 12

2017

These guidelines consist of 10 pages.

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1. INTRODUCTION

The Curriculum and Assessment Policy Statement (CAPS) for Economics outlines the nature and purpose of the subject Economics. This guides the philosophy underlying the teaching and assessment of the subject in Grade 12.

The purpose of these Examination Guidelines is to:

- Provide clarity on the depth and scope of the content to be assessed in the Grade 12 National Senior Certificate (NSC) Examination in Economics.
- Assist teachers to adequately prepare learners for the examinations.

This document deals with the final Grade 12 external examinations. It does not deal in any depth with the School-Based Assessment (SBA).

These Examination Guidelines should be read in conjunction with:

- *The National Curriculum Statement (NCS) Curriculum and Assessment Policy Statement (CAPS): Economics*
- *The National Protocol of Assessment: An addendum to the policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), regarding the National Protocol for Assessment (Grades R–12)*
- The national policy pertaining to the programme and promotion requirements of the National Curriculum Statement, Grades R–12

2. ASSESSMENT IN GRADE 12

2.1 Format and composition of the Grade 12 EGD NSC question papers

PAPER 1: CIVIL (3 hours) In first-angle orthographic projection			PAPER 2: MECHANICAL (3 hours) In third-angle orthographic projection		
Q1	Civil analytical	±15%	Q1	Mechanical analytical	±15%
Q2	Interpenetration and development AND/OR Development of a transition piece AND/OR Solid geometry	±20%	Q2	Loci of a Helix AND/OR Loci of a cam AND/OR Loci of a point(s) of a mechanism	±20%
Q3	2-point perspective drawing	±20%	Q3	Isometric drawing	±20%
Q4	Civil working drawing including electrical features	±45%	Q4	Mechanical assembly	±45%
Total mark allocation		200	Total mark allocation		200
Total NSC contribution		100	Total NSC contribution		100

2.2 General instructions in Grade 12 EGD NSC question papers

- The question paper consists of FOUR questions.
- Answer ALL the questions.
- ALL drawings are in first-angle orthographic projection for PAPER 1 and third-angle orthographic projection for PAPER 2, unless stated otherwise.
- ALL drawings must be completed in pencil, using instruments, unless stated otherwise.
- ALL answers must be drawn accurately and neatly.
- ALL the questions must be answered on the QUESTION PAPER, as instructed.
- ALL the pages must be re-stapled in numerical sequence, irrespective of whether the question was attempted or not.
- Time management is essential in order to complete all the questions.
- Print your examination number in the block provided on every page.
- Any details or dimensions not given must be assumed in good proportion.

NOTE:

Although not included as a general instruction, additional **layout planning is essential** for drawings, e.g. interpenetrations and developments, solid geometry, mechanical assemblies, where a reference/starting point or position is not given.

2.3 Weighting of the cognitive levels for the combined totals of Grade 12

Application of Bloom's Taxonomy	
Cognitive level	Weighting
Lower order (Understanding and remembering)	±30%
Middle order (Analysing and applying)	±40%
Higher order (Creating and evaluating)	±30%

3. ELABORATION OF THE CONTENT FOR GRADE 12 (CAPS)

Teachers are advised to pay particular attention to the notes at the end of each section of the prescribed content highlighted in this document to improve the quality of passes at their centres.

- As prescribed on pages 12 and 13 of the EGD CAPS document, the content of the following topics remain applicable to all Grade 12 topics:

Applicable to ALL questions in both papers	
TOPIC	PRESCRIBED CONTENT
General drawing principles relevant to all types of drawings	<ul style="list-style-type: none"> Relevant line types, as contained in the <i>SANS (SABS) 10111 and 10143 Guidelines</i> <div style="border: 1px solid black; padding: 5px;"> <p>EGD GUIDELINES for PENCIL LINE-WORK: NOTE: A wooden pencil or a 0,3/0,5 clutch pencil with either a 2H, 3H or 4H lead should be used.</p> <ul style="list-style-type: none"> ➤ A-type line (darkest line): Border and title/name block/ panel; outlines and visible parts; answers of, e.g. loci; projection symbol; tables ➤ B-type line (medium line): All writing and numbering; dimensions; projection planes; auxiliary views; hatching; screw threads; folding lines, break lines ➤ C-type line (lightest line): Constructions; planning; projections; guidelines (for writing) ➤ Medium chain-line (B-type): Centre points of circles; centre lines (centre axes); section planes; assembly diagrams; building lines/boundaries (servitudes) ➤ Dark chain-line (A-type): Plumbing; water pipes; drainage; services, irrigation systems ➤ Short broken-line (B-type): Hidden detail; items to be removed on civil drawings ➤ Long broken-line (B-type): Contour lines on site plans </div> <ul style="list-style-type: none"> General lettering (writing) and annotation requirements, as contained in the <i>SANS (SABS) 10111 & 10143 Guidelines</i> General dimensioning requirements, as contained in the <i>SANS (SABS) 10111 & 10143 Guidelines</i>.
Freehand drawings	The basic hand movements needed to draw proportional single, multi-view and pictorial drawings on plain paper and/or grid sheets
Scales	<ul style="list-style-type: none"> Practice and apply different scales, e.g. 1 : 1, 15 : 1, 2 : 1, 1 : 2, 1 : 25, 1 : 50, 1 : 75, 1 : 100 The application of any scale to all types of drawings
Geometrical construction	<ul style="list-style-type: none"> Practice and apply the following constructions: bisecting lines and angles, perpendicular lines, angles, dividing a line, circle divisions, fillets, etc. Construct regular polygons with 3, 4, 5, 6 and 8 sides Ellipse
Descriptive geometry	<ul style="list-style-type: none"> Orthographic views of points, line segments and plane figures that are perpendicular, inclined or oblique to the projection planes The true length and true angle of line segments The true shapes of surfaces

- PAPER 1 topics and prescribed content**

QUESTION 1: ±15% (±30 marks) AND QUESTION 4: ±45% (±90 marks)	
TOPIC	PRESCRIBED CONTENT
Civil drawing	<p>Limited to single-storey dwellings, first-angle orthographic working drawings with floor plans, detailed elevations and sectional elevations showing the detail of the foundation to the roof.</p> <p>Include the following:</p> <ul style="list-style-type: none"> • Annotation (notes), labels, dimensioning, scales • Relevant abbreviations, drawing symbols, graphical symbols and representations • On ALL relevant views/elevations: detail of pitched and flat roofs (trusses, battens/purlins, covering, fascia, barge-board, wall plate, ceiling, etc.), gutters, rain-water downpipes and gullies, plumbing and drainage detail, electrical fittings (installations) and wiring diagrams, as well as all the other features and fixtures covered in Grades 10 and 11 • Hatching detail and the application of colours • Format and content of working drawing title panels • Detailed site plans showing all the relevant features and dimensions, including electrical, plumbing and drainage services detail, as well as all natural features, etc. • Calculation of perimeters and areas • The north point on all relevant drawings <p>NOTE:</p> <ul style="list-style-type: none"> • ALL aspects of all drawings must comply with the guidelines, drawing symbols, graphical symbols and representations contained in the <i>SANS 10143</i>. ALL features must therefore, where applicable, be drawn as symbols and, when dimensions are given or where relevant, to scale. • ALL substructure hatching may be drawn in neat freehand.

Continuation of PAPER 1 QUESTION 1 and QUESTION 4

NOTE:

- Although the primary focus of QUESTION 1 will be on the prescribed content of civil drawings, aspects from other topics could also be included.
- QUESTION 4 could be either ONE question only OR it could be subdivided into MORE THAN ONE question.

QUESTION 2: ±20% (±40 marks)	
TOPIC	PRESCRIBED CONTENT
Interpenetrations and development AND/OR	First-angle orthographic views showing the curve of interpenetration formed between two solids or pipes joined at 30°, 45°, 60° or 90°. <ul style="list-style-type: none"> The solids or pipes must be only right-regular prisms, with 3, 4, 5, 6 and 8 sides, and/or cylinders. The axes of the two solids or pipes must meet in a common plane, i.e. in-line only, but the curve of interpenetration could be non-symmetrical. The surface developments of: <ul style="list-style-type: none"> The parts of the interpenetrating solids or pipes
Development of a transition piece AND/OR	The surface developments of: <ul style="list-style-type: none"> Complex transition pieces Hoppers The focus should be on industrial examples.
Solid geometry	First-angle orthographic views of solids or a combination of solids , which includes solids with holes . The solids and shape of the holes may be either right-regular prisms or pyramids with 3, 4, 5, 6 and 8 sides only, cylinders or cones . The axes of the solids may be perpendicular, parallel or inclined to one principal projection plane only. Include the following: <ul style="list-style-type: none"> Sectional views The true shape of the cut surface
NOTE: <ul style="list-style-type: none"> ALL necessary construction and folding lines must be shown. Only the curves of irregular arcs may be drawn in neat freehand. However, inaccurate and/or untidy curves will be penalised. Hidden detail must only be shown if required. 	

QUESTION 3: ±20% (±40 marks)	
TOPIC	PRESCRIBED CONTENT
Perspective drawings	2-point perspective drawings of complex castings, dwellings and civil structures with overhangs , depth detail , circles and arcs . <ul style="list-style-type: none"> The HL, PP and SP may be varied to provide any desired view. NOTE: <ul style="list-style-type: none"> ALL necessary construction must be shown. Only the curves of circles and arcs on the perspective drawing may be drawn in neat freehand. However, inaccurate and/or untidy curves will be penalised. Hidden detail must only be shown if required.

- **PAPER 2 topics and prescribed content**

QUESTION 1: ±15% (±30 marks) AND QUESTION 4: ±45% (±90 marks)	
TOPIC	PRESCRIBED CONTENT
Mechanical drawings	<p>Third-angle orthographic working drawings with non-sectional, sectional, half-sectional and part-sectional views of complex mechanical assemblies.</p> <p>Include the following:</p> <ul style="list-style-type: none"> • Title, scale, hidden detail, dimensioning, cutting planes, hatching detail, notes and symbol of projection • Hexagonal bolts, nuts and lock nuts, washers/spacers, keys and keyways and appropriate labels • Different types of section, e.g. aligned section, revolved section, removed section • Conventional presentation of common features • Format and content of working drawing title blocks • Detailed drawings of individual components • Basic welding, machining and surface treatment symbols • Tolerances <p>NOTE:</p> <ul style="list-style-type: none"> • ALL aspects of all drawings must comply with the guidelines and conventional representations contained in the SANS 10111. • ALL necessary construction must be shown where required. • Hidden detail must only be shown if required.

Continuation of PAPER 2 QUESTION 1 and QUESTION 4

NOTE:

- Although the primary focus of QUESTION 1 will on the prescribed content of mechanical drawings, aspects from other topics could also be included.
- QUESTION 4 could be either ONE question only or it could be subdivided into MORE THAN ONE question.

4. CONCLUSION

This Examination Guidelines document is meant to articulate the assessment aspirations espoused in the CAPS document. It is therefore not a substitute for the CAPS document which teachers should teach to.

Qualitative curriculum coverage as enunciated in the CAPS cannot be over-emphasised.