



# basic education

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **ENGINEERING GRAPHICS AND DESIGN**

### **GUIDELINES FOR PRACTICAL ASSESSMENT TASKS**

**2013**

**These guidelines consist of 23 pages.**

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## INTRODUCTION

The seventeen National Curriculum Statement subjects which contain a practical component all include a Practical Assessment Task (PAT). These subjects are:

- AGRICULTURE: Agricultural Management Practices, Agricultural Technology
- ARTS: Dance Studies, Design, Dramatic Arts, Music, Visual Arts
- HSS: Life Orientation
- SCIENCES: Computer Applications Technology, Information Technology
- SERVICES: Consumer Studies, Hospitality Studies, Tourism
- TECHNOLOGY: Civil Technology, Electrical Technology, Engineering Graphics and Design, Mechanical Technology

A PAT allows the teacher to directly and systematically observe applied competence. The PAT comprises the application of knowledge and values and the demonstration and performance of skills particular to that subject and counts 25% (i.e. 100 marks) of the total National Senior Certificate (NSC) mark out of 400.

The Grade 12 PAT is implemented across the first three terms of the school year and should be undertaken as one extended task, which is broken down into different phases or a series of smaller activities that make up the PAT. The planning and execution of the PAT differ from subject to subject.

SECTION A is the guidelines to the teacher, describing the structure and the administration of the PAT, while SECTION B contains the tasks and the assessment tools for both the learner and the teacher.

## SECTION A (Teacher Guidelines)

### 1. The structure of the Practical Assessment Task (PAT) for EGD

As the Engineering Graphics and Design (EGD) **PAT** is a **compulsory national formal assessment task** that contributes 25% (i.e. 100 marks) towards a learner's final NSC mark, it is essentially the **third NSC examination paper** of EGD. All the **presentation requirements must therefore be adhered to and**, with the exception of the required research, **completed at school**, under the supervision of the EGD teacher. **Each learner must complete the PAT individually** and ALL the presentations must be **his/her own, original work**.

The primary purpose of the EGD PAT is to assess four subjective content and concept topics which are not assessed in the examination papers. These are:

- The design process
- The application of drawing knowledge and drawing skills to the design process
- CAD management and drawings
- The quality and neatness of freehand, instrument and CAD drawings

The EGD PAT is therefore designed to develop a learner's ability to integrate and apply knowledge and to demonstrate acquired levels of skills and competency. With the inclusion of the PAT into EGD, the learner is given an opportunity to apply acquired knowledge, skills and values in a creative way through the design process as outlined in LO2 in the National Curriculum Statement. The learner is given an opportunity to complete the PAT in an environment which is more conducive to the creative processes. This environment should therefore provide the learner with easier access to, and a wider variety of, resource material than would be available in a formal examination.

The various components of the EGD PAT gives the learner an opportunity to demonstrate the level of drawing skill that has been attained in all the appropriate drawing methods through the presentation of the required drawings.

Each EGD PAT consists of two parts:

Part A: The design process

Part B: Required working and pictorial drawings

Part A of both PATs focuses on LO2 and requires that the learner demonstrates a clear understanding of, and is able to apply, the design process. As part of the design process, the learner must be able to:

- Identify the problem(s) and formulate a design brief with specifications and constraints
- Conduct and make use of relevant external research in an appropriate way
- Generate a number of own ideas/concepts/solutions analytically and graphically
- Select a final solution(s) that demonstrates a clear understanding of the design brief within the context of the specifications and constraints
- Present the final solution(s) as working and pictorial drawings
- Provide clear evidence of continuous self-evaluation during the development of the PAT

Part B of both PATs focuses on LO3 and LO4 and requires that the learner demonstrates and provides evidence of a high level of knowledge and understanding of the concepts and content of Engineering Graphics and Design through the presentation of orthographic drawings and pictorial drawings.

Part A and Part B of both PATs also give the learner the opportunity to demonstrate that a high level of competency and skill has been attained in the following required EGD drawing methods:

- Freehand drawings prepared in pencil
- Instrument drawings prepared in pencil
- Using a CAD (Computer-aided Drawing/Design) system

Two Practical Assessment Tasks (PATs) are included in this document:

- PAT 1 is a design task in the context of civil technology.
- PAT 2 is a design task in the context of mechanical technology.

**NOTE:** Both PATs cover **LO1, LO2, LO3** and **LO4**.

Each learner must, with the guidance of the teacher, **select ONE** of the PATs contained in this document. Should the learner choose to complete both PATs, only ONE will be considered for summative assessment and promotion purposes.

### Elements that make up the PAT mark for Engineering Graphics and Design

ELEMENTS OF THE MARK FOR THE PRACTICAL ASSESSMENT TASK	
ELEMENT	MARK
The <b>design process</b>	<b>25</b>
The <b>correctness</b> of the <b>working and pictorial drawings</b>	<b>50</b>
The <b>drawing methods</b> (freehand, instrument and CAD)	<b>25</b>
<b>TOTAL</b>	<b>100</b>

## 2. Administration of the PAT

At the beginning of the academic year, the EGD teacher must ensure that **every Grade 12 learner receives a copy of the entire SECTION B** of the PAT document, i.e. **ALL the pages from page 7 to page 23**.

ALL the completed PATs must be submitted in time for summative assessment to be done before the commencement of provincial moderation in the **third term**. The PATs must therefore be **completed in the following phases during the first three terms**:

- **Phase 1:** Design process (completed by the end of the **1<sup>st</sup> term**)
- **Phase 2:** Presentation drawings (completed by the end of the **2<sup>nd</sup> term**)
- **Phase 3:** Completion of portfolio (before the commencement of moderation in the **3<sup>rd</sup> term**)

Although the phases could be done either **CYCLICALLY** or in **BLOCK TIMES**, it is recommended that **ONE ENTIRE DAY** per term be allocated for each phase, e.g. during the examinations.

The **teaching/period time** that may be allocated **for the completion of all three phases** of the PAT is **12 hours to a maximum of 16 hours**. Additional non-teaching/non-period time may, however, also be allocated for the completion of the PAT at school. However, the **total maximum time** for the completion of all the phases of the PAT should **not exceed 20 hours**.

To ensure that the PAT is completed within the stipulated time, it is essential that the teacher draw up a PAT **pacesetter/management plan** for the learners at the beginning of the year. Attached to the pacesetter/management plan must be target dates for the completion of the different components of the different phases. This will help learners to assess their own progress and teachers to set up intervention programmes.

**NOTE:**

- **ALL the presentation requirements** of the selected PAT must be adhered to and, with the exception of the required research, **completed at school, under guidance and supervision from the EGD teacher**, who must observe the learners' progress at all times. **Not adhering to this instruction will be deemed as an examination irregularity.**
- It is the **teacher's responsibility** to ensure that **each learner's PAT** is of an **appropriate higher order Grade 12 complexity!**

**3. Assessment and moderation of the PAT****3.1 Assessment**

Frequent developmental feedback is needed to guide and give support to each learner and to ensure that each learner is on the right track.

Both formal and informal assessment should be conducted throughout the development of the PAT. Informal assessment can be conducted by the learner, a peer, a group of learners or by the teacher. **However, the teacher must conduct ALL the formal assessment, by using the official 2013 summative assessment sheet, and record the results on the official mark sheets himself/herself.**

The completed PAT must be submitted in time for final formal assessment to be done before the commencement of provincial moderation. **Once the PAT has been formally assessed, the teacher must retain the PAT for the purpose of external moderation.** All the PATs must also be retained at the school for the period of time as prescribed by the Provincial Departments of Education.

**3.2 Moderation**

**Monitoring and/or moderation of the PAT can take place at any time during the development of the PAT. ALL completed presentation requirements of the PAT must therefore always be available at the school.** During a moderation process, the moderator will randomly select the PAT files/portfolios that will be moderated. To assist the process of the final provincial moderation, the teacher must supply the moderator with a completed mark sheet(s) and a merit list(s).

During the moderation process, learners may be called upon to explain the functions and principles of operating a CAD system and to demonstrate drawing skills through performing capability tasks.

**3.3 Declaration of authenticity**

Prior to the final submission of the PAT for formative assessment, ALL the learners and the teacher must complete the Declaration of Authenticity as laid out on the final page of this document.

**NOTE:**

**Only the official 2013 SUMMATIVE ASSESSMENT SHEET (page 22) and the completed DECLARATION OF AUTHENTICITY form (page 23) of this document must be included in the front of the learner's completed PAT file/portfolio.**

**SECTION B (Learner Tasks)****GENERAL INFORMATION AND INSTRUCTIONS**

- The EGD PAT is a **compulsory national formal assessment task** that contributes 25% towards your final National Senior Certificate (NSC) mark.
- This **document contains TWO PATs**, i.e. a civil design project (PAT 1) and a mechanical design project (PAT 2). **You, the learner**, with the guidance of your EGD teacher, must **select ONE** of the PATs contained in this document.
- ALL the **presentation requirements** of the selected PAT **must be adhered to and**, with the exception of the required research, **completed at school**, under the supervision of your EGD teacher.
- The PAT must be **completed individually** and ALL the presentations, including the front page and index, must be **your own, original work**.
- The PAT must be **completed in phases and within the given time frame** of your teacher's PAT pacesetter/management plan.
- ALL **freehand drawings** and **instrument drawings** must be **prepared in pencil**.
- Untidy and messy work, as well as the late submission of presentation requirements, will be penalised.

**PRACTICAL ASSESSMENT TASK 1****A CIVIL DESIGN PROJECT****SCENARIO**

A couple, living in the Montagu area in the south-western Karoo, own a property which is situated on the corner of Claasen and Ernie Streets.

On the property is an old Cape Dutch house dating back to the late 1800s and a freestanding outbuilding, consisting of a garage and a washing room, which was built in the 1970s.

As the Montagu area is experiencing a shortage of self-catering accommodation for tourists and guests, the couple have decided that if they altered and extended the existing outbuilding to provide much-needed self-catering accommodation, they could supplement their income.

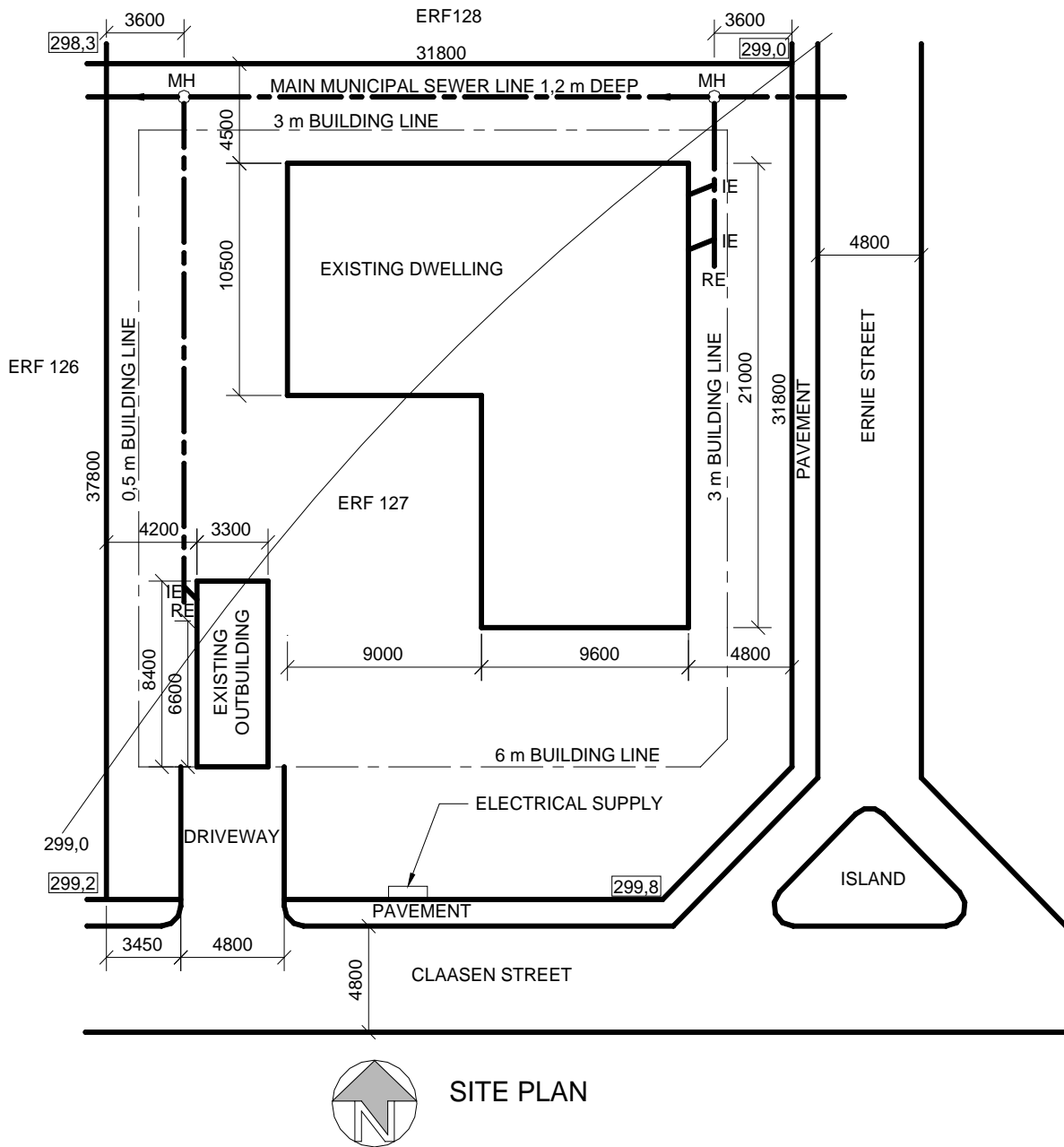
The couple approached you to provide them with ideas for the proposed alterations to the existing outbuilding and to draw the plans for them. During your meeting with the couple, they mentioned that because of its historical significance, the old house may not be altered in any way as they intend to open it up to the public for viewing. The couple also requested that the alterations should complement the old house, in order to enhance the aesthetic appeal of the property, and that the existing roof must be replaced by a thatched roof. They also indicated that although the existing outbuilding may be altered and extended, it may not be demolished.

**Given:**

The site plan of the existing property

**NOTE:**

Any details or dimensions not given may be assumed in good proportion.





**Specifications of the existing dwelling:**

- It is an old Cape Dutch house dating back to the late 1800s.
- There are gables on the southern and western ends of the house.
- All the walls are plastered and finished in white.
- It has originally styled wooden frame windows and wooden doors.
- It has a thatched roof.

**Specifications of the existing outbuilding:**

- The outer walls are standard load-bearing brick walls, plastered on the outside.
- The inner wall is a standard non-load-bearing brick wall.
- It has a single garage with a wooden tip-up door that opens onto Claasen Street.
- It has a 2 860 x 1 580 washing room on the northern side.
- Both the garage and washing room have a standard wooden door on the east-facing wall.
- The washing room has a 700 x 1 700 wooden frame window on the north-facing wall.
- The garage has a 1 000 x 2 200 wooden frame window on the east-facing wall.
- The outbuilding has a 30° pitched roof covered with Canadian pattern asbestos cement.

**Specifications of the site:**

- The site has a fall of 1,5 metres from the south-eastern side to north-western side.

**Specifications for the proposed alterations for the self-catering accommodation:**

**NOTE:** The existing outbuilding must form part of the alterations for the self-catering accommodation. It may therefore be altered, but not demolished.

- It must be a single-story structure(s).
- The total area of entire structure(s), excluding the carports, may not exceed 84 m<sup>2</sup>.
- The entire structure(s), excluding the carports, must be covered by a thatched roof(s).
- ALL features and finishes of the structure(s) must complement those of the old Cape Dutch house.
- It must include TWO accommodation units, each containing the following:
  - Sleeping facilities for FOUR
  - A bathroom with at least a toilet, shower and hand washbasin
  - A living area
  - A built-in heating system(s)
- It must include ONE kitchen, to be shared by both units, equipped with the following:
  - A stove
  - A fridge
  - A microwave oven
  - Kitchen units for all the crockery and cutlery
  - A double sink
- Each accommodation unit must have a carport.
- There must be a secluded garden with TWO separate braai areas.
- There must be sufficient security.

**Presentation requirements for the PAT:****Create a PAT file/portfolio containing:**

- a. A complete **cover page**
- b. An **index**
- c. The **2013 SUMMATIVE ASSESSMENT SHEET** (see page 22)
- d. The completed **DECLARATION OF AUTHENTICITY** (see page 23)

**Present the following design process requirements in the PAT file/portfolio after the DECLARATION OF AUTHENTICITY:**

**NOTE:**

Include the following on each page of each design process requirement:

- Clear **numbering** in accordance with the numbers of the presentation requirements
- The **learner's name**
- The **date of completion** and **submission**

1. **Identify the primary and secondary problem(s)** and formulate a **comprehensive design brief** that includes a description of the clients' requests and requirements as well as the proposed alterations.

Include an **extended and comprehensive** list of **specifications** and **constraints**.

2. Conduct your own **relevant research** on each of the following:
  - Layouts of self-catering accommodation units
  - Old Cape Dutch style architecture used in the Montagu area
  - Thatched roofs
  - Build-in heating systems

**NOTE:**

- Evidence of **ALL** the **resource material** used for the **relevant research** must be **presented as proof** that ALL the required research has been done.
- There must be clear evidence that the research has been used.
- Include a list of ALL **references** used (**bibliography**).

3. **Generate** detailed self-explanatory **freehand drawings** of at least **THREE possible design solutions** for the alterations. The freehand drawings must show **dimensions, labels** and **notes**, as well as the **correct presentation** of ALL the **features**.

**NOTE:**

- These drawings must provide clear evidence that a high level of competency has been attained in **freehand drawings** as one of the required **EGD drawing methods**.
- All the drawings must comply with the *SANS (SABS) 0143 Guidelines*.

4. **Select the best solution**, which demonstrates an in-depth understanding of the design brief within the context of the specifications and constraints, by **evaluating** the possible design solution of each freehand drawing.

**Summarise** the reasons for the final selection.

5. **Present** the selected solution as **working and pictorial drawings (5.1, 5.2 and 5.3)** that adhere to the following:

- All the drawings must be presented on appropriately sized drawing sheets, correctly set up with borders and **appropriate civil title blocks/panels**.
- The **working and pictorial drawings** must provide clear evidence that a high level of competency has been attained in the following **TWO** required **EGD drawing methods**:
  - **Instrument drawings**
  - **CAD (Computer-aided Drawing/Design)**

**NOTE:**

- The **one orthographic drawing** (i.e. **5.1 or 5.2**) must be prepared as an **instrument drawing** and the **other** by using a **CAD system**.
- The perspective drawing (5.3) may be prepared either as an instrument drawing **or** by using a CAD system.
- **Schools that do not have CAD facilities must prepare all the required working and pictorial drawings (5.1, 5.2 and 5.3) as instrument drawings.**
- All drawings must comply with the *SANS (SABS) 0143 Guidelines*.

5.1 A detailed **working drawing** of all the proposed alterations for the self-catering accommodation, **clearly showing all the features**. The drawing must show a **minimum** of **FOUR** orthographic views drawn to a suitable scale.

The views must include:

5.1.1 The **floor plan**

5.1.2 A **sectional elevation**

5.1.3 **TWO elevations**, showing the **front view** and a **side view**

**The following must be included on all relevant views:**

- ALL accommodation, kitchen and bathroom/sanitary fixtures
- ALL electrical fittings and the wiring detail
- The built-in heating system
- The detail of the thatched roof construction
- Waste-water disposal systems (sewerage)
- Labels, notes and fixture codes
- Scale(s)
- Dimensions
- Cutting plane(s)
- All hatching detail

5.2 A detailed **site plan** drawn to a suitable scale.

**The following must be included:**

- ALL new, altered and existing structures
- ALL services, sewerage and drainage connections
- Electrical supply to the new and existing structures
- Driveways and the complete layout of the garden and braai areas
- Labels, notes and fixture codes
- Scale
- Dimensions
- Corner heights and contours

**NOTE:** The site plan may contain artistic features or it may be rendered.

5.3 A detailed **two-point perspective drawing** that will give the viewer the most descriptive view of the proposed self-catering accommodation. The horizon line (HL) must be placed 1,7 m above the ground in order to produce a human eye level.

**Evidence of the following must be included together with the drawing:**

- All views/drawings used to produce the drawing
- The construction/method used to produce the drawing

**NOTE:** The perspective drawing may contain artistic features or it may be rendered so that it can be used as the cover page of the presentation (PAT).

**NOTE:**

- These drawings (5.1, 5.2 and 5.3) are the **minimum required working and pictorial drawings**.

6. Provide clear evidence, in the form of a **checklist(s)**, of **continuous self-evaluation** and of the **meeting** of all the **deadlines** during the development of the PAT.

### **Assessment criteria**

The following assessment tools will be used to assess the PAT:

- The rubric in ANNEXURE A for assessing the **design process**.  
This mark will contribute **25 marks** to the final PAT mark.
- The rubric in ANNEXURE B for assessing the **correctness** of the **presentation drawings**.  
This mark will contribute **50 marks** to the final PAT mark.
- The rubric in ANNEXURE C for assessing the **drawing methods**, i.e. **drawing technique**, the quality of **line work, printing, dimensioning, etc.**  
This mark will contribute **25 marks** to the final PAT mark.

## **PRACTICAL ASSESSMENT TASK 2**

### **A MECHANICAL DESIGN PROJECT**

#### **SCENARIO**

You are a member of a team of industrial designers that are employed by a firm that specialises in providing mechanical and industrial design services on **mechanical parts/components** contained within **products** for the **OFFICE EQUIPMENT INDUSTRY**.

The designers are tasked with investigating and analysing the design features of an existing product and to come up with new or improved ideas. The improvement(s) to the product could be one or more of the following:

- To improve efficiency
- To simplify its current design
- To change its application

#### **The PAT requires the following stages:**

- The first stage involves **selecting/finding a suitable product**, which must include **mechanical movement** as part of its function, from the **OFFICE EQUIPMENT INDUSTRY**. The product must be an **assembly** consisting of a **minimum of FOUR different manufactured parts/components**, e.g. office chairs, equipment stands, staplers, paper punches, paper shredders, paper binders, guillotines, date stamps, etc.

#### **NOTE:**

It is not required of you to purchase a new product. The selected product should therefore be something that is **already available to you**.

- The second stage involves the **dismantling** of the product so that **all the mechanisms and parts/components** can be **revealed, investigated and measured**.
- The third stage involves the identification of **ONE** of the **main component** or **combination of components** of the product which could be **improved, modified or redesigned** in some way. This will necessitate the applications of the **design process**, as stipulated by the presentation requirements for this PAT.

#### **Specifications of the selected product:**

- Your **teacher must approve** the **product** in order to ensure that it **meets all the requirements** and that it is of an **appropriate higher order Grade 12 complexity**.
- The product must be from the **OFFICE EQUIPMENT INDUSTRY**.
- The product must be an **assembly** consisting of a **minimum of FOUR different manufactured parts/components**.
- The **product** must include **mechanical movement** as part of its function.
- The **product** or detailed photographs of the product, if it is too large, **must be submitted as part of the PAT presentation requirements**.

**Presentation requirements for the PAT:****Create a PAT file/portfolio containing:**

- a. A complete **cover page**
- b. An **index**
- c. The **2013 SUMMATIVE ASSESSMENT SHEET** (see page 22)
- d. The completed **DECLARATION OF AUTHENTICITY** (see page 23)

**Present the following design process requirements in the PAT file/portfolio after the DECLARATION OF AUTHENTICITY:**

**NOTE:**

Include the following on each page of each design process requirement:

- Clear **numbering** in accordance with the numbers of the presentation requirements
- The **learner's name**
- The **date of completion** and **submission**

1. **Identify the primary and secondary problem(s)** and formulate of a **comprehensive design brief** that includes an explanation of the function and design features of the selected product, as well as of the proposed improvement, modification or redesign of the identified main component(s).

Include a **comprehensive** list of **specifications** and **constraints**.

2. Conduct your own **relevant research** on each of the following:
  - All the materials that are used for the parts/components of the selected product
  - Specific design features and/or function (purpose) of each individual part/component of the selected product
  - At least **THREE** other products that have the same function as the product you selected, but that differs in terms of design

**NOTE:**

- Evidence of **ALL** the **resource material** used for the **relevant research** must be **presented** as **proof** that ALL the required research has been done.
- There must be clear evidence that the research has been used.
- Include a list of ALL **references** used (**bibliography**).

3. **Generate** detailed self-explanatory **freehand drawings** of at least **THREE possible improvements, modifications or redesigns** of the identified main component(s). The freehand drawings must show **dimensions, labels** and **notes**, as well as the **correct presentation** of ALL the features.

**NOTE:**

These drawings must provide clear evidence that a high level of competency has been attained in **freehand drawings** as one of the required **EGD drawing methods**.

4. **Select the best solution/improvement/modification/redesign**, which demonstrates an in-depth understanding of the design brief within the context of the specifications and constraints, by **evaluating** the possible design solution of each freehand drawing. **Summarise** the reasons for the final selection.

5. **Present** the selected product as well as the selected solution as **working and pictorial drawings (5.1, 5.2 and 5.3)** that adhere to the following:

- All the drawings must be presented on appropriately sized drawing sheets, correctly set up with borders and **appropriate mechanical title blocks**.
- The **working and pictorial drawings** must provide clear evidence that a high level of competency has been attained in the following **TWO** required **EGD drawing methods**:
  - **Instrument drawings**
  - **CAD (Computer-aided Drawing/Design)**

**NOTE:**

- The **one orthographic drawing** (i.e. **5.1 or 5.2**) must be prepared as an **instrument drawing** and the **other** by using a **CAD system**.
- The isometric drawing (5.3) may be prepared either as an instrument drawing **or** by using a CAD system.
- **Schools that do not have CAD facilities must prepare all the required working and pictorial drawings (5.1, 5.2 and 5.3) as instrument drawings.**
- All drawings must comply with the *SANS (SABS) 0111-1 Guidelines*.

5.1 A detailed **assembly drawing** showing all the parts of the **selected product before** any improvements, modifications or redesigns. The drawing must show a **minimum of FOUR appropriate** orthographic views drawn to a suitable scale.

The views must include:

5.1.1 The **front view**

5.1.2 A **second primary (main) view**

5.1.3 Any **TWO** other **secondary views**

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

**The following must be included:**

- Scale
- Dimensions
- Labels and notes
- Cutting planes
- All hatching detail

5.2 A **detailed drawing** of the **selected solution/improvement/modification/redesign** of the identified main component(s). The drawing must show a **minimum of THREE appropriate** orthographic views drawn to a suitable scale.

The views must include:

5.2.1 The **front view**

5.2.2 Any **TWO** other **views**

**NOTE: ONE** of the **views must be sectioned** or contain **types of section**.

**The following must be included:**

- A comprehensive list of explanatory labels and notes
- Relevant welding and/or machining symbols
- Scale
- Dimensions
- Cutting plane(s)
- All hatching detail

5.3 A detailed **isometric drawing** of the selected product or of the improved, modified or redesigned main component(s) of the product, drawn to a suitable scale.

**Evidence of the following must be included:**

- All views/drawings used to produce the drawing
- The constructions/methods used to produce the drawing

**NOTE:**

- Include relevant labels and notes.
- The drawing may contain artistic features and/or it may be rendered.

**NOTE:**

- These drawings (5.1, 5.2 and 5.3) are the **minimum required working and pictorial drawings**.

6. Provide clear evidence, in the form of a **checklist(s)**, of **continuous self-evaluation** and of the **meeting** of all the **deadlines** during the development of the PAT.

**Assessment criteria**

The following assessment tools will be used to assess the PAT:

- The rubric in ANNEXURE A for assessing the **design process**.  
This mark will contribute **25 marks** to the final PAT mark.
- The rubric in ANNEXURE B for assessing the **correctness** of the **presentation drawings**.  
This mark will contribute **50 marks** to the final PAT mark.
- The rubric in ANNEXURE C for assessing the **drawing methods**, i.e. **drawing technique**, the quality of **line work, printing, dimensioning, etc.**  
This mark will contribute **25 marks** to the final PAT mark.



**A SIMPLIFIED RUBRIC FOR THE ALLOCATION OF MARKS**

<b>MARK ALLOCATION for all aspects/criteria of the PAT</b>			
<b>DESCRIPTION FOR MARK</b>	<b>GENERAL INDICATOR</b>	<b>± %</b>	<b>MARK</b>
<b>ALL/MORE than ALL</b> the REQUIREMENTS are met. - <b>PERFECT</b> -	<b>Error free</b>	<b>100%</b>	<b>10</b>
<b>ALL (ALMOST ALL)</b> the REQUIREMENTS are met. - <b>OUTSTANDING</b> -	<b>Very few errors</b>	<b>90% +</b>	<b>9</b>
<b>ALMOST ALL (MOST OF)</b> the REQUIREMENTS are met. - <b>VERY GOOD</b> -	<b>Few errors</b>	<b>80% +</b>	<b>8</b>
The REQUIREMENTS are <b>SUBSTANTIALLY</b> met. - <b>GOOD</b> -	<b>Some errors</b>	<b>70% +</b>	<b>7</b>
The REQUIREMENTS are <b>ADEQUATELY</b> met. - <b>SATISFACTORY</b> -		<b>60% +</b>	<b>6</b>
The REQUIREMENTS are <b>MODERATELY</b> met. - <b>ACCEPTABLE</b> -	<b>Many errors</b>	<b>50% +</b>	<b>5</b>
<b>ONLY SOME</b> of the REQUIREMENTS are met. - <b>UNACCEPTABLE</b> -		<b>40% +</b>	<b>4</b>
<b>VERY FEW</b> of the REQUIREMENTS are met. - <b>NOT ACHIEVED</b> -	<b>Mostly wrong</b>	<b>30% +</b> Only a few correct features	<b>3</b>
The REQUIREMENTS are <b>NOT</b> met. - <b>VERY POOR</b> -	<b>Completely wrong</b>	<b>29% &amp; LESS</b> Something done very wrongly/poorly	<b>2</b>
			<b>1</b>
<b>NOT DONE!</b>	<b>No work handed in!</b>	<b>Nothing to mark!</b>	<b>0</b>

## ANNEXURE A

## RUBRIC FOR ASSESSING THE DESIGN PROCESS

MARK ALLOCATION	LEVELS OF PERFORMANCE										
	10	9	8	7	6	5	4	3	2	1	0
	100%	99%–90%	89%–80%	79%–70%	69%–60%	59%–50%	49%–40%	39%–30%	29%–20%	19%–1%	0%
1. A <b>design brief</b> demonstrating a clear understanding of the scenario with a list of the <b>specifications</b> and <b>constraints</b>	The <b>design brief</b> with a <b>comprehensive</b> list of the <b>specifications</b> and the <b>constraints</b> demonstrating an <b>in-depth</b> and <b>comprehensive</b> understanding of the scenario	The <b>design brief</b> with a <b>complete</b> or <b>incomplete</b> list of the <b>specifications</b> and the <b>constraints</b> demonstrating a <b>satisfactory</b> understanding of the scenario	The <b>design brief</b> with the possibility of an <b>incomplete</b> list of the <b>specifications</b> and/or the <b>constraints</b> demonstrating an <b>elementary</b> understanding of the scenario	A <b>design brief</b> with either a <b>very vague</b> or <b>no list</b> of <b>specifications</b> and/or <b>constraints</b> demonstrating <b>little</b> or <b>no</b> understanding of the scenario							
2. Evidence of <b>relevant 'external' research</b> with the inclusion of a <b>bibliography</b>	Shows evidence of <b>in-depth</b> and <b>thorough relevant 'external' research</b> that is <b>used</b> within the <b>final solution</b> as well as a <b>comprehensive bibliography</b>	Shows evidence of <b>satisfactory relevant 'external' research</b> of which <b>some</b> is <b>used</b> within the <b>final solution</b> as well as a <b>satisfactory bibliography</b>	Shows evidence of <b>limited research</b> of which <b>little to none</b> is <b>used</b> within the <b>final solution</b> with a <b>limited bibliography</b>	Shows <b>very little</b> evidence of any <b>research</b> or research that is <b>inappropriate</b> with <b>little to no bibliography</b>							
3. <b>THREE freehand drawings of detailed possible solutions</b>	The <b>possible solutions</b> are very clearly, logically and comprehensively presented with <b>dimensions</b> and <b>notes</b> with <b>ALL the features presented correctly</b>	The <b>possible solutions</b> are clearly presented with <b>dimensions</b> and <b>notes</b> with <b>most features presented correctly</b>	The <b>possible solutions</b> are not clearly presented with <b>no dimensions</b> and <b>notes</b> with only some <b>features presented correctly</b>	Shows <b>little to no</b> possible solutions							
4. <b>Selecting the final/best solution</b> which demonstrates a clear <b>understanding</b> of the <b>design brief</b>	A <b>thorough selection process</b> and a <b>final/best solution</b> that demonstrates a clear <b>in-depth</b> and <b>comprehensive</b> understanding of the <b>design brief</b> (correctness/functionality/practicality of design)	A <b>substantial selection process</b> and a <b>final solution</b> that demonstrates a <b>satisfactory</b> understanding of the <b>design brief</b>	An <b>incomplete</b> or <b>no selection process</b> and a <b>final solution</b> that demonstrates a <b>limited</b> understanding of the <b>design brief</b>	<b>No selection process</b> and a <b>final solution</b> that demonstrates <b>little to no</b> understanding of the <b>design brief</b>							
6. Clear evidence of continuous <b>self-evaluation</b> and the <b>meeting of deadlines</b> of <b>all the requirements</b> of the PAT	Clear evidence of continuous <b>comprehensive self-evaluation</b> of all the requirements of the PAT and <b>ALL</b> the requirements were <b>handed in</b> on the <b>due dates</b>	Evidence of <b>satisfactory self-evaluation</b> of most of the requirements of the PAT and most of the requirements were <b>handed in</b> by the <b>extension date</b>	Evidence of <b>limited self-evaluation</b> of some of the requirements of the PAT and <b>few</b> deadlines were <b>met</b> . <b>Extension dates were missed</b> but <b>most stages</b> were <b>handed in</b> .	<b>Little</b> or <b>no</b> evidence of any <b>self-evaluation</b> shown and <b>none</b> of the <b>deadlines</b> were met							
7. The <b>presentation</b> of the <b>complete PAT file/portfolio</b>	<b>All the required presentations</b> of the PAT are <b>complete</b> and <b>neatly presented</b> in the prescribed <b>sequence</b> in the <b>PAT file/portfolio</b>	<b>Most of the required presentations</b> of the PAT are <b>complete</b> and <b>neatly presented</b> in the prescribed <b>sequence</b> in the <b>PAT file/portfolio</b>	<b>Some of the required presentations</b> of the PAT are <b>complete</b> and <b>presented</b> in the <b>PAT file/portfolio</b>	<b>Very few</b> of the <b>required presentations</b> are <b>complete</b> and poorly <b>presented</b> in the <b>PAT file/portfolio</b>							

**ANNEXURE B**

**RUBRIC FOR ASSESSING CORRECTNESS OF THE WORKING AND PICTORIAL DRAWINGS**

LEVELS OF PERFORMANCE												
MARK ALLOCATION	10	9	8	7	6	5	4	3	2	1	0	
	100%	99%–90%	89%–80%	79%–70%	69%–60%	59%–50%	49%–40%	39%–30%	29%–20%	19%–1%	0%	
All drawing sheets are appropriately set up with a <b>border</b> and an <b>appropriate title block/panel</b> .		All drawing sheets are appropriately set up with <b>more than the minimum requirements</b> .			Most of the drawing sheets are appropriately set up <b>with the minimum requirements</b> .			Only <b>some</b> of the drawing sheets are set up <b>with less than the minimum requirements</b> .		Little or no page set-up is evident.		
Orthographic drawings	<b>PAT 1: Assess</b> each view's ' <b>design</b> ' and <b>correctness</b> of the <b>presentation</b> according to the specifications and constraint, the stipulated requirements and EGD drawing principals. <b>PAT 2: Assess</b> each view's <b>accurate</b> reflection of the product and the <b>correctness</b> of the <b>presentation</b> according to the stipulated requirements and EGD drawing principals.											
	5.1	5.1.1	View 1 PAT 1: Plan PAT 2: Front view	The view meets the <b>minimum requirements</b> and has <b>no/a few errors</b> .	The view meets most of the <b>minimum requirements</b> but contains <b>some errors</b> .	The view contains <b>less than the minimum requirements</b> and contains <b>many errors</b> .	Little or no evidence of the required view					
	5.1.2	View 2 PAT 1: Section PAT 2: 2 <sup>nd</sup> main view	The view meets the <b>minimum requirements</b> and has <b>no/a few errors</b> .	The view meets most of the <b>minimum requirements</b> but contains <b>some errors</b> .	The view contains <b>less than the minimum requirements</b> and contains <b>many errors</b> .	Little or no evidence of the required view						
	5.1.3	View 3 PAT 1: 2 elevations PAT 2: 2 secondary views	The views meet the <b>minimum requirements</b> and have <b>no/a few errors</b> .	The views meet most of the <b>minimum requirements</b> but contain <b>some errors</b> .	The views contain <b>less than the minimum requirements</b> and contain <b>many errors</b> .	Little or no evidence of the required views						
	5.2	<b>PAT 1 and PAT 2: Assess</b> each view's ' <b>design</b> ' and <b>correctness</b> of the <b>presentation</b> according to the specifications and constraints, the stipulated requirements and EGD drawing principals.										
	PAT 1: Site plan PAT 2: Detailed drawing	The site plan/detailed drawing meets the <b>minimum requirements</b> and has <b>no/a few errors</b> .	The site plan/detailed drawing meets the <b>minimum requirements</b> but contains <b>some errors</b> .	The site plan/detailed drawing contains <b>less than the minimum requirements</b> and contains <b>many errors</b> .	Little or no evidence of required views							
Pictorial drawing	5.3	The <b>correct drawing method</b> and <b>presentation</b> PAT 1: 2-point perspective PAT 2: Isometric	<b>Thorough</b> knowledge of the <b>correct pictorial drawing method</b> and the answer meets the requirements and reflects the <b>correct size and proportion</b> of all the features and has <b>no/a few errors</b> and the presentation is very good/ <b>outstanding</b> .	<b>Satisfactory</b> knowledge of the <b>correct pictorial drawing method</b> and the answer meets the requirements and reflects the <b>correct size and proportion</b> of most of the features but contains <b>some errors</b> and the presentation is <b>satisfactory</b> .	<b>Some</b> knowledge of the <b>pictorial drawing method</b> is shown, but the answer reflects poor or incorrect <b>size and proportion</b> and many of the features contain <b>many errors</b> and the presentation is <b>poor</b> .	Little or no evidence of required drawings						

**ANNEXURE C**

**RUBRIC FOR ASSESSING DRAWING METHOD, SKILLS AND PRESENTATION**

LEVELS OF PERFORMANCE													
MARK ALLOCATION			10	9	8	7	6	5	4	3	2	1	0
			100%	99%–90%	89%–80%	79%–70%	69%–60%	59%–50%	49%–40%	39%–30%	29%–20%	19%–1%	0%
Freehand drawing	TECHNIQUE	The drawings display the <b>correct drawing technique</b> as well as good <b>proportion</b> and <b>size</b>	The drawings display <b>excellent drawing technique and all the features</b> show <b>outstanding proportion and size</b> .			The drawings display <b>satisfactory drawing technique and most/some features</b> show <b>satisfactory proportion and size</b> .			The drawings display <b>poor drawing technique</b> and the features show <b>poor proportion and size</b> .			The drawings display very <b>poor drawing technique</b> and the features show <b>very little or no correct proportion</b> .	
		Final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality</b> and <b>printing</b> .	Drawings are <b>very neat</b> and all line work/line quality, printing and dimensioning are <b>outstanding and consistent</b> .			Drawings are <b>neat</b> and line work/line quality, printing and dimensioning are <b>generally good and mostly consistent</b> .			Drawings are <b>untidy</b> with <b>inconsistent</b> line work/line quality, printing and dimensioning.			The line work/line quality, printing and dimensioning are <b>unacceptable</b> .	
Pencil instrument drawing	TECHNIQUE	The drawings display the <b>correct use of drawing instruments, drawing methods and techniques</b> .	The drawings display the correct use of drawing <b>instruments</b> and an <b>outstanding</b> application of <b>drawing methods and techniques</b> .			The drawings display the correct use of drawing <b>instruments</b> and a <b>satisfactory and mostly correct</b> application of <b>drawing methods and techniques</b> .			The drawings display the correct use of drawing <b>instruments</b> and a <b>poor and often incorrect</b> application of <b>drawing methods and techniques</b> .			The drawings display an incorrect use of drawing <b>instruments with incorrect</b> applications of <b>drawing methods and techniques</b> .	
		The final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality</b> and <b>printing</b> .	Drawings are <b>very neat</b> and all line work/line quality, printing and dimensioning are <b>outstanding and consistent</b> .			Drawings are <b>very neat</b> and the line work/line quality, printing and dimensioning are <b>generally good and mostly consistent</b> .			Drawings are <b>untidy</b> and the line work/line quality, printing and dimensioning are <b>inconsistent</b> .			The line work/line quality, printing and dimensioning are <b>unacceptable</b> .	
CAD drawing	<b>(ANNEXURE D) RUBRIC FOR ASSESSING CAD DRAWING SKILLS, KNOWLEDGE AND ABILITY</b>												
	TECHNIQUE	The <b>level of competence</b> displayed in <b>using a CAD system</b>	Displays a <b>high level</b> of skills, knowledge and ability in using a <b>CAD system</b>			Displays a <b>satisfactory level</b> of skills, knowledge and ability in using a <b>CAD system</b>			Displays a <b>poor level</b> of skills, knowledge and ability in using a <b>CAD system</b>			Shows <b>little to no skills, knowledge or ability</b> in using a <b>CAD system</b>	
	The <b>layout and correctness</b> of the <b>final drawing presentation</b>	<b>100%–80%</b>	<b>79%–70%</b>	<b>69%–60%</b>	<b>59%–50%</b>	<b>49%–40%</b>	<b>39%–30%</b>	<b>29%–0%</b>					

**ANNEXURE D****RUBRIC FOR ASSESSING CAD DRAWING SKILLS, KNOWLEDGE AND ABILITY**

LEVELS OF PERFORMANCE												
MARK ALLOCATION	10	9	8	7	6	5	4	3	2	1	0	
	100%	99%–90%	89%–80%	79%–70%	69%–60%	59%–50%	49%–40%	39%–30%	29%–20%	19%–1%	0%	
Set up a drawing interface	Is able to set up a drawing interface without any assistance, displaying a high level of skills, knowledge and ability			Is able to set up a drawing interface with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up a drawing interface with some assistance displaying a lack of skills, knowledge and ability			Shows little to no understanding of setting up a drawing interface		
Set up a 2-D/3-D drawing environment	Is able to set up a 2-D/3-D drawing environment without any assistance, displaying a high level of skills, knowledge and ability			Is able to set up a 2-D/3-D drawing environment with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up a 2-D/3-D drawing environment with some assistance, displaying a lack of skills, knowledge and ability			Shows little to no understanding of setting up a 2-D/3-D drawing environment		
Set up layers with properties assigned to each layer	Is able to set up layers and assign properties to each layer without any assistance displaying a high level of skills, knowledge and ability			Is able to set up layers and assign properties to each layer with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up layers and assign properties to each layer with some assistance, displaying a lack of skills, knowledge and ability			Shows little to no ability to set up layers and assign properties to each layer		
Set up a drawing sheet with a border and a title block	Is able to set up a drawing sheet with a border and a title block without any assistance, displaying a high level of skills, knowledge and ability			Is able to set up a drawing sheet with a border and a title block with some assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to set up a drawing sheet with a border and a title block with some assistance, displaying a lack of skills, knowledge and ability			Shows little to no ability to set up a drawing sheet with a border and a title block		
Show evidence of the correct use of the drawing tools	Thorough and detailed evidence is shown of using the drawing tools correctly.			Satisfactory evidence is shown of using the drawing tools correctly.			Limited evidence is shown of using the drawing tools correctly.			Little to no evidence is shown of using the drawing tools correctly.		
Show ability to save and retrieve work	Is able to save and retrieve work without any assistance, displaying a high level of skills, knowledge and ability			Is able to save and retrieve work with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to save and retrieve work with some assistance, displaying a lack of skills, knowledge and ability			Shows little to no ability to save/retrieve work		
Show ability to plot a drawing	Is able to plot a drawing without any assistance, displaying a high level of skills, knowledge and ability			Is able to plot a drawing with a little assistance, displaying a satisfactory level of skills, knowledge and ability			Is able to plot a drawing with some assistance, displaying a lack of skills, knowledge and ability			Shows little to no ability to plot work		
The <b>layout</b> and <b>correctness</b> of the final <b>drawing presentation</b>	100%–80%		79%–70%		69%–60%		59%–50%		49%–40%		39%–30%	29%–0%

## PRACTICAL ASSESSMENT TASK 2013 SUMMATIVE ASSESSMENT SHEET

SCHOOL: .....

NAME OF LEARNER: .....  
(SURNAME AND INITIALS)

EXAMINATION NUMBER: .....

PART A: Design Process		PART B: Working and pictorial drawings				Drawing competency and skill				
CRITERIA		MARK		CRITERIA		MARK				
ANNEXURE A	1	A <b>design brief</b> demonstrating a <b>clear understanding</b> of the <b>scenario</b> with a list of the <b>specifications</b> and <b>constraints</b>		All drawing sheets are appropriately set up with a <b>border</b> and a <b>appropriate title block/panel</b> .		Freehand drawings ANNEXURE C	TECHNIQUE	The drawings display the <b>correct drawing technique</b> as well as good <b>proportion</b> and <b>size</b> .		
	2	Evidence of <b>relevant 'external' research</b> with the inclusion of a <b>bibliography</b>					The final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality, printing</b> and <b>dimensioning</b> .			
	3	THREE freehand drawings of detailed possible solutions	1 <sup>st</sup>	Freehand drawing	Orthographic drawings ANNEXURE B	Assess the following: PAT 1: The design and correctness PAT 2: The accuracy and correctness	5.1.1	View 1	PAT 1: Plan PAT 2: Front view	
			2 <sup>nd</sup>	Freehand drawing			5.1.2	View 2	PAT 1: Section PAT 2: 2 <sup>nd</sup> main view	
			3 <sup>rd</sup>	Freehand drawing			5.1.3	View 3	PAT 1: 2 elevations PAT 2: 2 secondary views	
	4	Selecting the <b>final/best solution</b> which demonstrates a <b>clear understanding</b> of the <b>design brief</b>		5.2	PAT 1: <b>Site plan</b> PAT 2: <b>Detailed drawing</b>		Pencil instrument drawings – ANNEXURE C	TECHNIQUE	The drawings display the <b>correct use of drawing instruments, drawing methods</b> and <b>techniques</b> .	
	6	Clear evidence of <b>continuous self-evaluation</b> and the <b>meeting of deadlines</b> of <b>all the requirements</b>		5.3	The correct <b>drawing method</b> and the <b>presentation</b> of the drawing PAT 1: <b>2-p perspective</b> PAT 2: <b>Isometric</b>			The final drawing presentation is <b>neat</b> and there is consistency of <b>line work/line quality, printing</b> and <b>dimensioning</b> .		
7	The <b>presentation</b> of the <b>complete PAT file/portfolio</b>		Pictorial drawing ANNEXURE B		TECHNIQUE		The level of <b>competence</b> displayed in using a <b>CAD system</b>			
<b>Criteria Total</b>				<b>Criteria Total</b>				<b>TOTAL without CAD</b>		
CALCULATION				CALCULATION				<b>TOTAL with CAD</b>		
<b>Teacher's TOTAL</b>				<b>Teacher's TOTAL</b>				<b>Teacher's TOTAL</b>		
<b>TOTAL: A</b>	/ 25	<b>TOTAL: B</b>	/ 50	<b>TOTAL: C</b>		/ 25				
<b>Moderated TOTAL</b>				<b>Moderated TOTAL</b>				<b>Moderated TOTAL</b>		
<b>TOTAL: A</b>	/ 25	<b>TOTAL: B</b>	/ 50	<b>TOTAL: C</b>		/ 25				
<b>TEACHER'S TOTAL:</b>		A + B + C =		/ 100		<b>ASSESSOR:</b> Initial		<b>MODERATOR:</b> Initial		
<b>MODERATED TOTAL:</b>		A + B + C =		/ 100						

### DECLARATION OF AUTHENTICITY

To be submitted with each learner's Practical Assessment Task portfolio

NAME OF SCHOOL: .....

NAME OF LEARNER: .....  
(SURNAME AND INITIALS)

EXAMINATION NUMBER: .....

**I hereby declare that all the contents of the Practical Assessment Task submitted by myself for assessment is my own, original work and has not been plagiarised, copied from someone else or previously submitted for assessment.**

\_\_\_\_\_  
SIGNATURE OF CANDIDATE

DATE \_\_\_\_ / \_\_\_\_ / 2013  
(DD / MM / YYYY)

NAME OF TEACHER: .....  
(SURNAME AND INITIALS)

**As far as I know, the above declaration by the candidate is true and I accept that the PAT offered is his/her own work.**

\_\_\_\_\_  
SIGNATURE OF TEACHER

DATE \_\_\_\_ / \_\_\_\_ / 2013  
(DD / MM / YYYY)

