



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

MECHANICAL TECHNOLOGY (FITTING AND MACHINING)

GUIDELINES FOR PRACTICAL ASSESSMENT TASKS

GRADE 12

2026

These guidelines consist of 26 pages.

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1. INTRODUCTION

The 18 Curriculum and Assessment Policy Statements 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
- **SCIENCES:** Computer Applications Technology, Information Technology
- **SERVICES:** Consumer Studies, Hospitality Studies, Tourism
- **TECHNOLOGY:** Civil Technology, Electrical Technology, Mechanical Technology and Engineering Graphics and Design
- **TECHNICAL:** Technical Mathematics, Technical Sciences

A practical assessment task (PAT) is a compulsory component of the final promotion mark for all candidates offering subjects that have a practical component and counts 25% (100 marks) of the end-of-the-year examination mark. The PAT is implemented across the first three terms of the school year. This is broken down into different phases or a series of smaller activities that make up the PAT. The PAT allows for learners to be assessed on a regular basis during the school year and it also allows for the assessment of skills that cannot be assessed in a written format, e.g. test or examination. It is therefore important that schools ensure that all learners complete the practical assessment tasks within the stipulated period to ensure that learners are resulted at the end of the school year. The planning and execution of the PAT differs from subject to subject.

The PAT allows the teacher to directly and systematically observe applied competence. The PAT comprises the application/performance of the knowledge, skills and values particular to that subject and counts 25% of the total promotion/certification mark out of 400 for the subject.

Any profession requires of its members a thorough grounding in both theory and practice, and MECHANICAL TECHNOLOGY is no exception. It is emphasised that the goal of the practical assessment task is to produce a skilled candidate in each specialisation field. A nation's true wealth is in its manpower and education that should aim to develop the talents of a candidate so that he/she can contribute to the well-being of the society by using and developing scientific and technological resources.

To prepare a candidate in the MECHANICAL TECHNOLOGY'S specialisation fields, one must focus on the following:

- An attitude where the candidate can selectively use ideas, gather evidence and facts and draw logical conclusions to put them to good use creatively and with imagination;
- A capability to express ideas and information clearly by speech, writing, drawing and manufacturing; and
- A willingness and capability to accept and exercise responsibility, to make decisions, and to learn by experience.

Attributes such as these cannot all be achieved in a classroom. A sound knowledge of engineering sciences is essential to equip the MECHANICAL TECHNOLOGY candidate with the necessary practical capabilities for the required processes. Practical training is the application of acquiring essential skills to bridge between trade theory and practice.

Practical application in the workshop must therefore be made an interesting and challenging experience to develop the candidates physically and mentally. The candidates must show their initiative, curiosity and persistence in learning. In order to stimulate and develop self-confidence, the granting of some degree of responsibility during the practical application is very important.

2. TEACHER GUIDELINES

2.1 Administration of the PAT

Teachers are requested to make copies of the different specialisation PAT documents. These documents need to be handed out to the candidates at the beginning of the year. The practical assessment task for Grade 12 is externally set, internally assessed and externally moderated.

Teachers must attach due dates for the different facets of the PAT (*refer to the CAPS document*). In this manner, candidates can easily assess their progress. It is the responsibility of the teacher to administer formal assessment.

The PAT should be completed within the first three terms. The PAT should be completed under controlled conditions. (*Refer to CAPS document.*)

Should the candidate make mistakes on a specific facet, or a specific PAT phase is not done according to instruction, the candidate can be given an extended opportunity within the allocated time frame of the phase to redo the facet or phase so that it is of satisfactory quality. EACH candidate MUST have a complete copy of the PAT document in his/her portfolio of evidence.

Teachers MUST build a prototype of the task to be able to demonstrate to the candidates what the final product should look like. There may be no deviations or changes to any design, dimensions or marks. The model must be completed strictly according to the guidelines. It will guide the candidates with visual presentation. It provides the teacher with insight into possible challenges regarding machines, equipment or material and what possible manufacturing procedures he/she needs to follow in the workshop to complete the PAT. The prototype must be presented by the teacher to the moderator when moderation of the PAT starts.

All phases are to be completed at school under teacher supervision. No PAT is supposed to leave the school premises until the external moderation has been conducted.

2.2 Assessment of the PAT

Frequent developmental feedback is needed to ensure necessary guidance and support to the candidates.

Both formal and informal assessment should be conducted to ensure that the embedded skills are developed. Informal assessments must be conducted to monitor the progress of the candidates. On completion of a phase, the candidate must use the rubric and complete the mark sheet under the heading of self-assessment to conduct his/her own informal assessment before the teacher conducts formal assessment. The candidate must sign and date the mark sheet on completion of each self-assessment.

On completion of a candidate's own informal assessment, the teacher must use the same mark sheet in the candidate's portfolio of evidence to complete the formal assessment and provide feedback comments (if needed) to the candidate.

All mark sheets in the candidate's portfolio of evidence must be signed by the teacher, departmental head and moderator (if the candidate was moderated). The formal mark must be recorded on the composite mark sheet. The composite mark sheets MUST be signed by the teacher, departmental head and the principal before external moderation commences.

On completion of each phase in each term, the marks for the completed phase need to be recorded onto the South African School Administration and Management System (SASAMS).

2.3 Moderation of the PAT

Internal moderation by the departmental head of the school **MUST** be conducted for each completed phase of the task. Evidence of moderation reports must be available in the teacher file and be available as proof for provincial and external moderation. The internal moderator must use the same mark sheets which are available in the candidate's portfolio of evidence whereby the candidate has conducted self-assessment, with formal assessment by the teacher.

Marks must be recorded in the space provided for internal moderation. The marks on the school administration system, captured by the school, must be verified by the moderator against the composite mark sheet. The tasks/phases, assessment criteria and the mark sheets must be presented to the moderator during moderation of the PAT.

The moderator should be able to call on a candidate to explain and demonstrate the functions, principles and skills during the moderation process.

On completion, the moderator will, if necessary, adjust the marks of the group upwards or downwards should he/she deem it necessary.

All tasks/phases must be clearly marked with the correct date, initials, surname and signature of the candidate.

All phases must be completed according to the programme of assessment in these guidelines by end of **August 2026**. Provincial moderation must be conducted in the month of September by the PED, to be ready for national external moderation in October 2026.

2.4 Consequences of absence/non-submission of tasks.

If a candidate's practical assessment task is incomplete or unavailable with a valid reason, the candidate may be given three weeks before the commencement of the final end-of-year examination to submit the outstanding task. Should the candidate fail to fulfil the outstanding PAT requirement, such a candidate will be awarded a zero mark for that PAT component.

A candidate's results are regarded as incomplete if he/she does not present any component of the PAT task. Should the candidate fail to fulfil the outstanding PAT requirement, the marks for these components will be omitted and the final mark for Mechanical Technology will be adjusted for promotion purposes in terms of the completed tasks. If any tasks are still outstanding, the candidate runs the risk of not being resulted at the end of the year. He/She will be given another opportunity **based on the decision of the head of the assessment body**.

2.5 Declaration of Authenticity

NAME OF SCHOOL:

NAME OF CANDIDATE:

(FULL NAMES AND SURNAME)

NAME OF TEACHER:

I hereby declare that the practical assessment tasks submitted for assessment is my own, original work and has not been previously submitted for moderation.

SIGNATURE OF CANDIDATE

DATE

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

SIGNATURE OF TEACHER

DATE

SCHOOL STAMP

3. CANDIDATE GUIDELINES

Instructions to the candidates

- The PAT consists of a specialisation task in **Fitting and Machining**. The practical work is spread over three terms, as set out in this document. (See *CAPS document*.)
- All phases must be completed according to the time frames set out in this document.
- Candidates are requested to actively engage in the PAT.
- Candidates who are uncooperative will receive demerits or a zero mark for that particular section of the work.
- Candidates who act unsafely in the workshop and place other candidates in danger, will be given additional corrective tasks to improve their safety awareness.
- Your PAT must be fully completed by the end of **August 2026** to be ready for provincial and/or national moderation.
- Your PAT needs to be **clearly marked** with your name and surname.
- On completion of a phase, you need to conduct self-assessment by using the provided marking rubric in this document.
- On completion of your self-assessment, you must present your completed phase and portfolio of evidence to the teacher for formal assessment and feedback.
- You **MUST** complete the **Declaration of Authenticity** to declare that the project you presented for formal assessment is your own work.
- Each term must have a completed phase in order to enter the mark on the working mark sheet and the South African School Administration and Management System (SA-SAMS).

4. SPECIALISATION: FITTING AND MACHINING (SPECIFIC)**TASK: COMBINATION OF SOFT FACE AND CROSS-PEEN HAMMERS**

Below are examples of the different hammers. These are **ONLY** examples and do not reflect the final product to be made.



FIGURE 1: EXAMPLE 1 – CROSS-PEEN HAMMER



FIGURE 2: EXAMPLE 2 – SOFT-FACE HAMMER



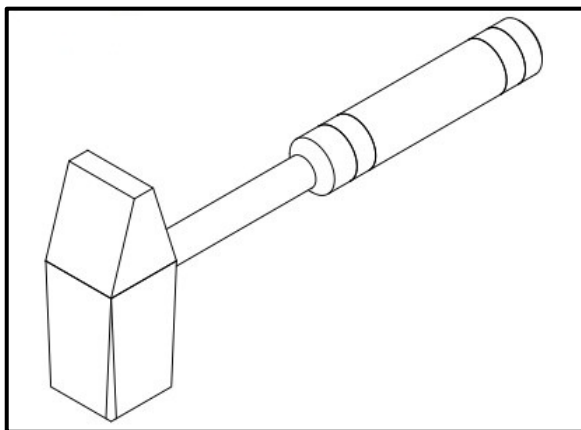
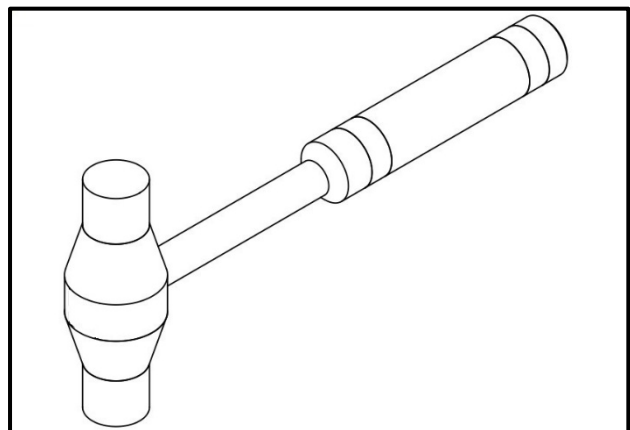
FIGURE 3: EXAMPLE OF EXPLODED VIEW OF HANDLE WITH A HAMMER HEAD

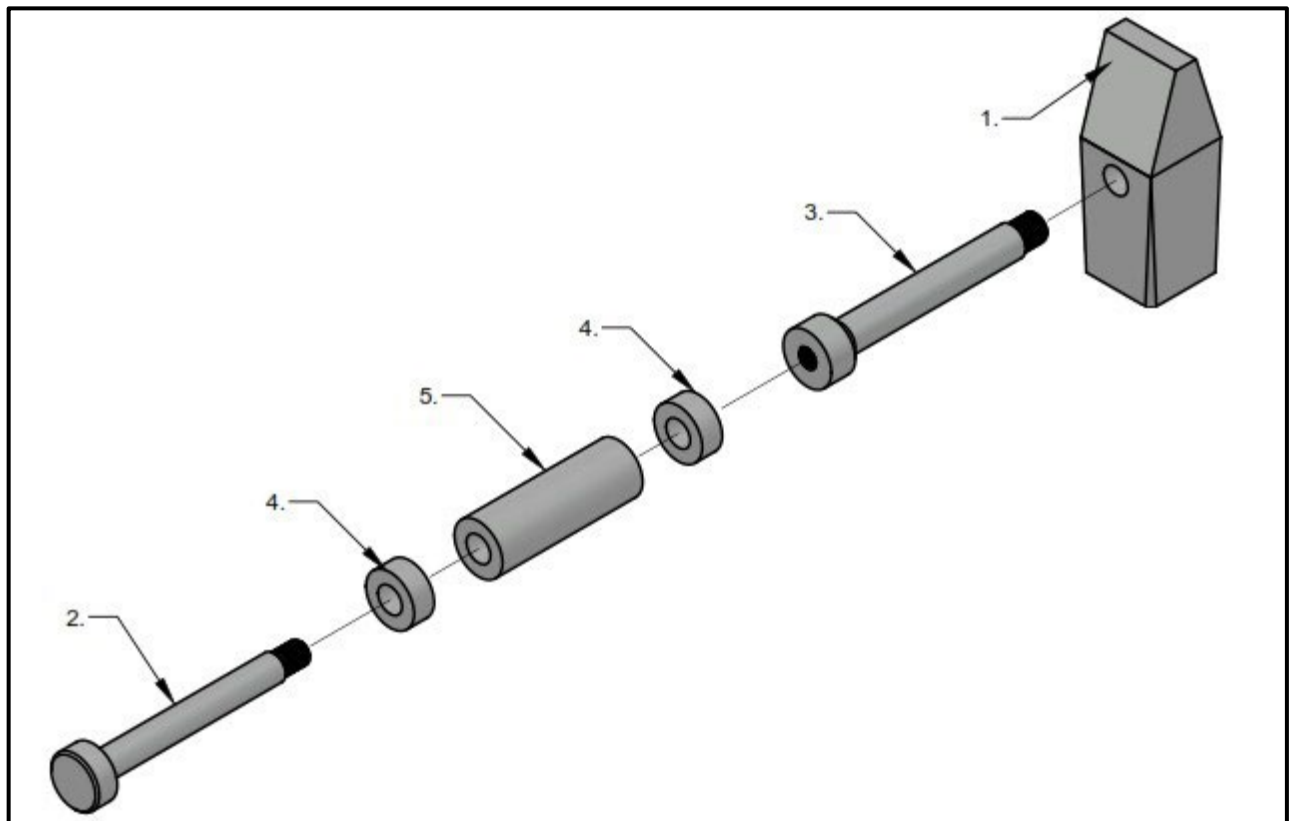
Term: 1 to 3**Start date: January 2026****Completion date: August 2026****The following standards must be achieved:**

- All sizes must be within the given tolerance.
- There must be no damage to tools and equipment.
- All appropriate safety procedures must be adhered to.
- The project must be well presented.
- It is **COMPULSORY** for the candidates to manufacture **BOTH** heads.
- Only **ONE** handle is to be manufactured as the heads are interchangeable.

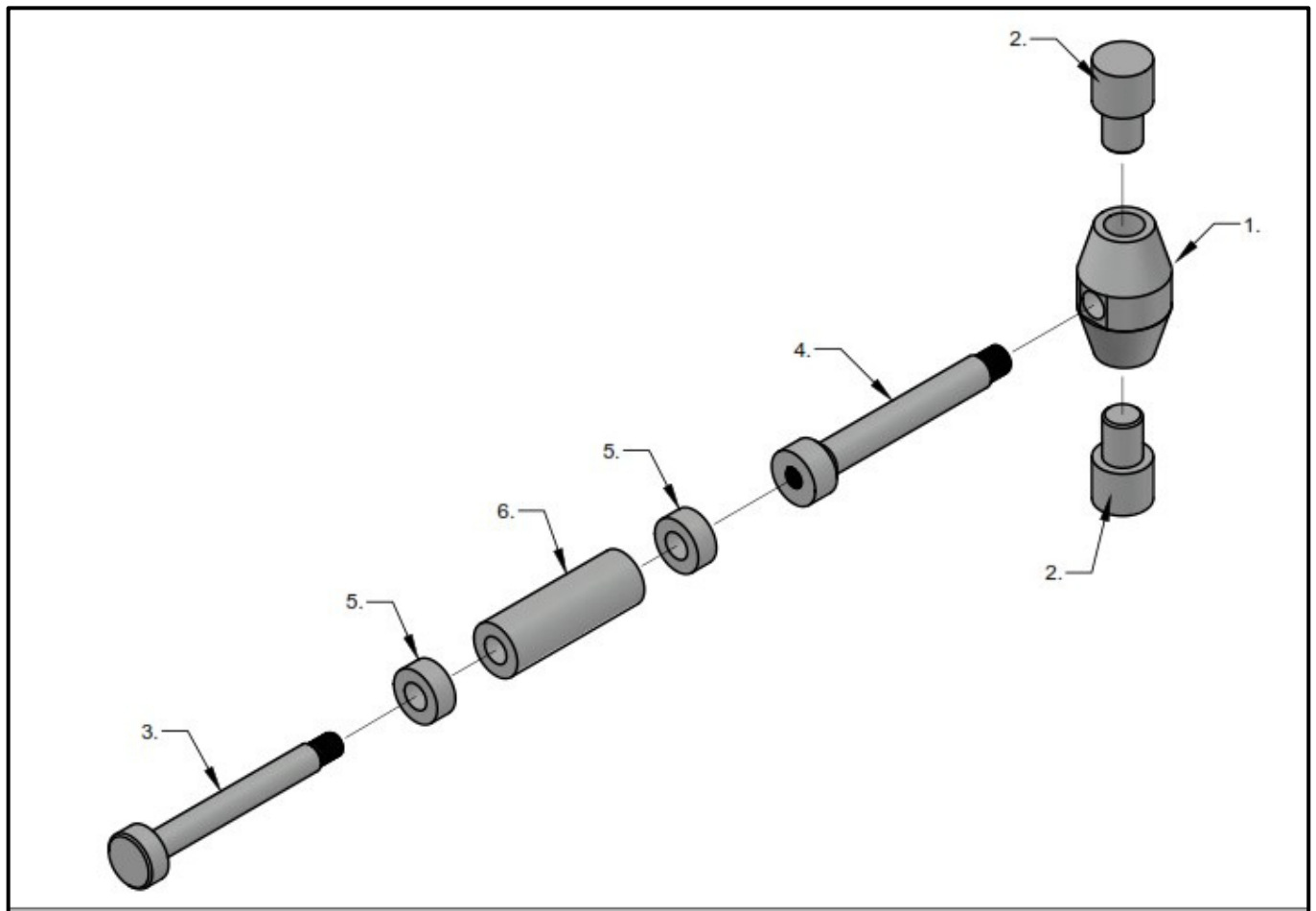
RESOURCES REQUIRED FOR THE PAT:

CONSUMABLE MATERIALS REQUIRED PER CANDIDATE					
Part	Material	Cutting list	Quantity per candidate	No. of candidates	Total quantity
Soft faces	Nylon/Teflon/Brass	Ø25 x 50	2		
Soft-face hammer head	Aluminium/Mild steel	Ø36 x 80	1		
Cross-peen hammer head	Aluminium/Mild steel	25 x 25 x 90	1		
Handle screw	Aluminium/Mild Steel	Ø25 x 120	1		
Handle shaft	Aluminium/Mild Steel	Ø25 x 120	1		
Handle	Aluminium/Mild Steel/ Nylon/Teflon/Brass	Ø25 x 90	1		
Handle inserts	Different types of material as handle	Ø25 x 50	1		

ISOMETRIC VIEW**FIGURE 4: ISOMETRIC DRAWING – CROSS-PEEN HAMMER****FIGURE 5: ISOMETRIC DRAWING – SOFT-FACE HAMMER**

EXPLODED VIEW – CROSS-PEEN HAMMER**FIGURE 6: EXPLODED VIEW**

PARTS	
1	Cross-peen hammer head
2	Handle screw
3	Handle shaft
4	Insert rings
5	Handle

EXPLODED VIEW – SOFT-FACE HAMMER**FIGURE 7: EXPLODED VIEW**

PARTS	
1	Soft-face hammer head
2	Soft-face hammer inserts
3	Handle screw
4	Handle shaft
5	Insert rings
6	Handle

RUBRICS**DRILLING AND TAPPING**

NOTE: Use RUBRIC A below for assessment of all holes drilled.

RUBRIC A – DRILLING OF HOLES	
Assessment facet	Mark
Hole drilled in correct position on workpiece	1
Drilling of correct diameter	1
Depth correctly drilled (blind or open hole)	1
Hole perpendicular to workpiece	1
Hole clean and without burrs	1
Subtotal:	5

NOTE: Use RUBRIC B below for assessment of all screw threads tapped.

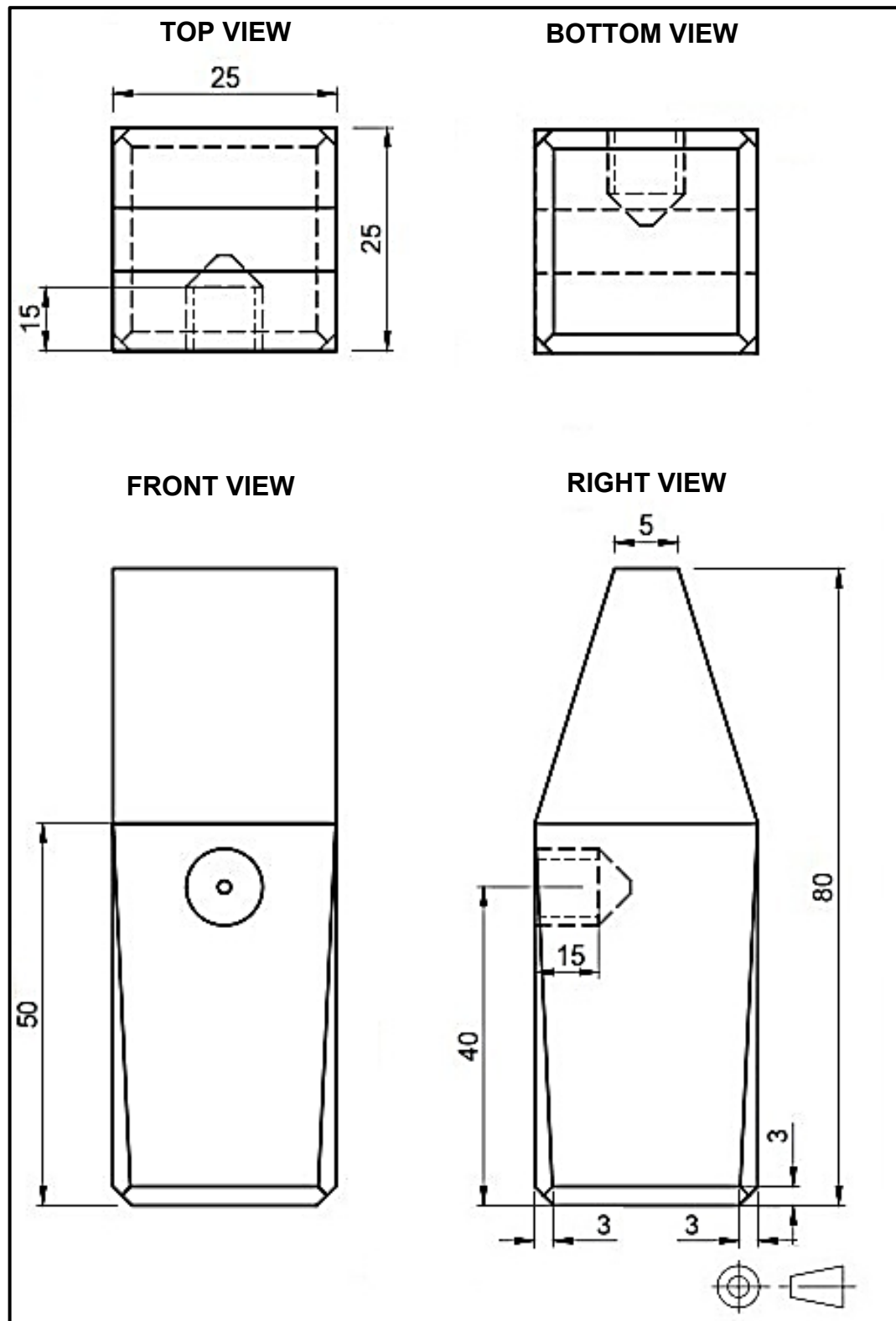
RUBRIC B – TAPPING OF SCREW THREADS	
Assessment facet	Mark
Tapped correct screw thread	1
Screw thread perpendicular to workpiece	1
Screw thread is clean and smooth	1
Depth/Length tapped correctly	1
No defects (e.g. cross thread)	1
Subtotal:	5

TOLERANCE RANGES**LENGTHS AND DIAMETERS**

NOTE: On all the lengths and diameters candidates will lose 1 mark for every 0,1 mm deviation from the basic size. Use RUBRIC C for assessment of all lengths and diameters.

RUBRIC C – LENGTHS AND DIAMETERS	
Deviation	Mark deductions
0–0,1	-0
0,1–0,2	-1
0,2–0,3	-2
0,3–0,4	-3
0,4–0,5	-4

NOTE: In the event of a candidate exceeding both length and diameter as per given rubric, then the candidate should be allocated 1 mark for process completed CORRECTLY.

PHASE 1: CROSS-PEEN HAMMER HEAD
January–March 2026**FIGURE 8: CROSS-PEEN HAMMER HEAD**

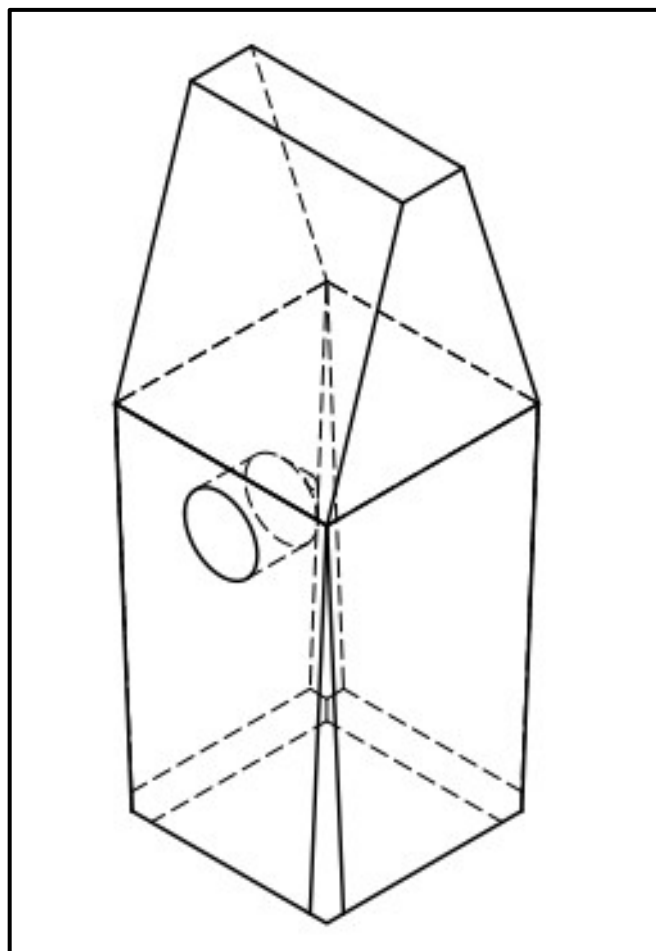
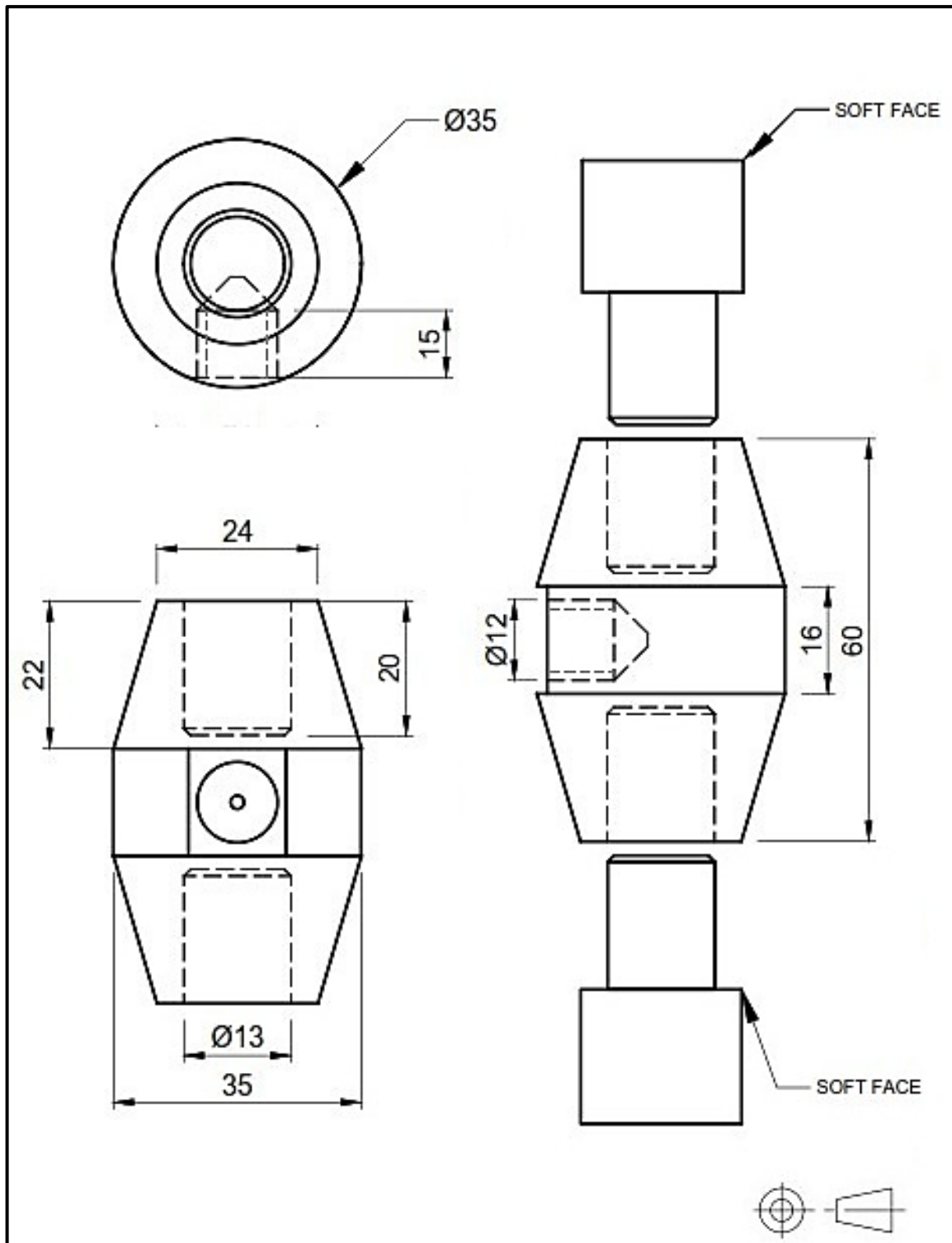


FIGURE 9: ISOMETRIC VIEW OF CROSS-PEEN HAMMER HEAD

MECHANICAL TECHNOLOGY							
FITTING AND MACHINING							
MARK SHEET – CROSS-PEEN HEAD – PHASE 1							
GRADE	12	DATE					
PROJECT	COMBINATION OF SOFT-FACE AND CROSS-PEEN HAMMERS						
CANDIDATE'S NAME:							
FACETS	MARKS	Candidate – Self-assessment	Teacher Assessment	Internal Moderation	Provincial Moderation	External Moderation	TEACHER'S COMMENTS
		1	2	3	4	5	
File/Mill sides 25 x 25 mm	5						
File/Mill length 80 mm	5						
Drill hole Ø10,2 mm for tapping according to required dimensions	5						
Tap M12 x 1,75 to fit handle	5						
Mark off the profile of the cross-peen sides	5						
Mill cross-peen sides x 2	10						
Cross-peen size – 5 mm	5						
Mark off and file the bottom and sides according to drawing	5						
Finishing	5						
PHASE 1 TOTAL:	50						
MODERATOR'S COMMENTS:							
NAME AND SIGNATURE OF CANDIDATE							
NAME AND SIGNATURE OF TEACHER							
NAME AND SIGNATURE OF TECHNICAL DEPARTMENTAL HEAD							
NAME AND SIGNATURE OF PROVINCIAL MODERATOR							
NAME AND SIGNATURE OF EXTERNAL MODERATOR							

PHASE 2: SOFT-FACE HAMMER HEAD
April–June 2026**FIGURE 10: SOFT-FACE HAMMER HEAD**

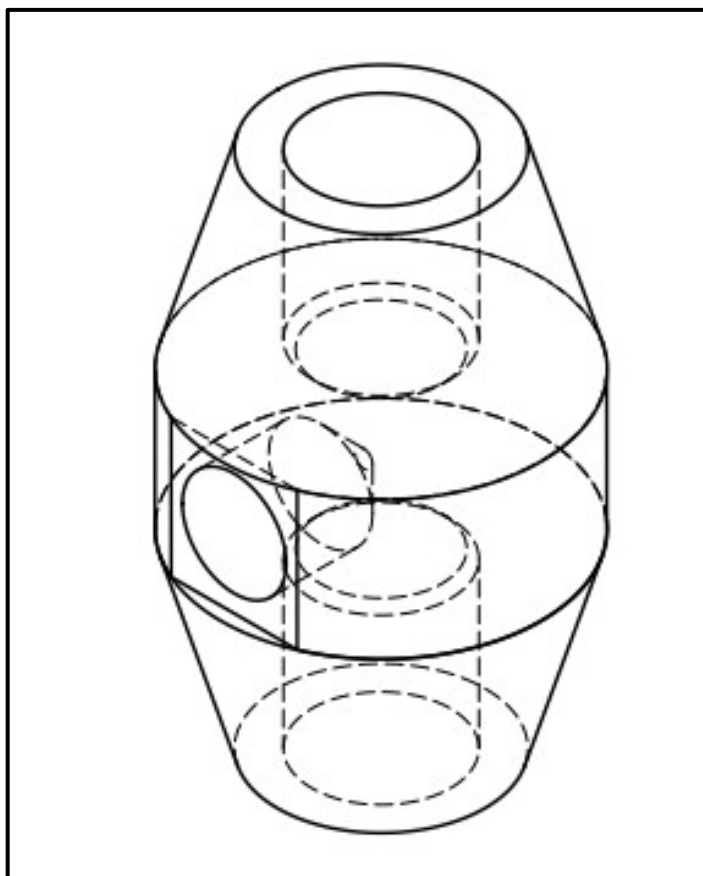


FIGURE 11: ISOMETRIC VIEW OF SOFT-FACE HAMMER HEAD

PHASE 2 – WORKSHEET 2.1: CALCULATIONS**CANDIDATE'S NAME:**

Calculate the required setting of the compound slide for taper cutting.

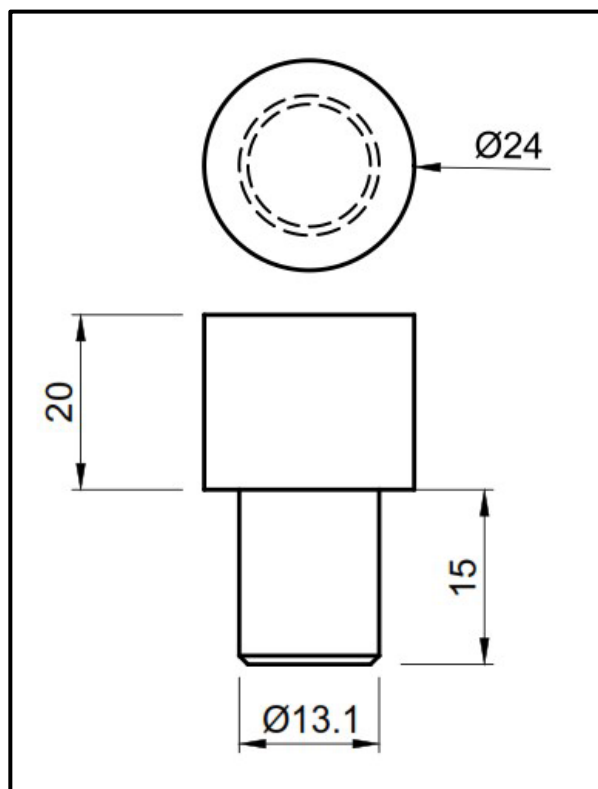
NOTE: Actual **precise dimensions** from diameter cut must be used for calculating setting of compound slide.

Candidate's own diameter measured:

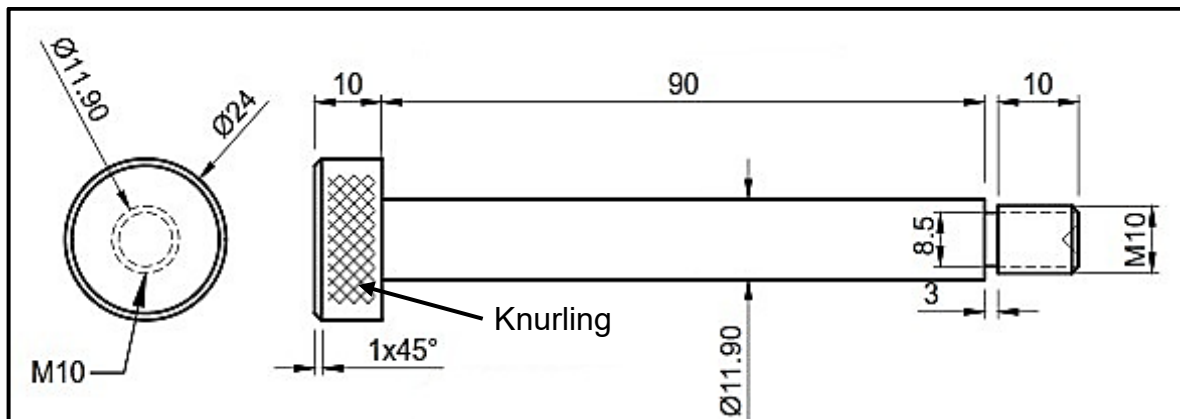
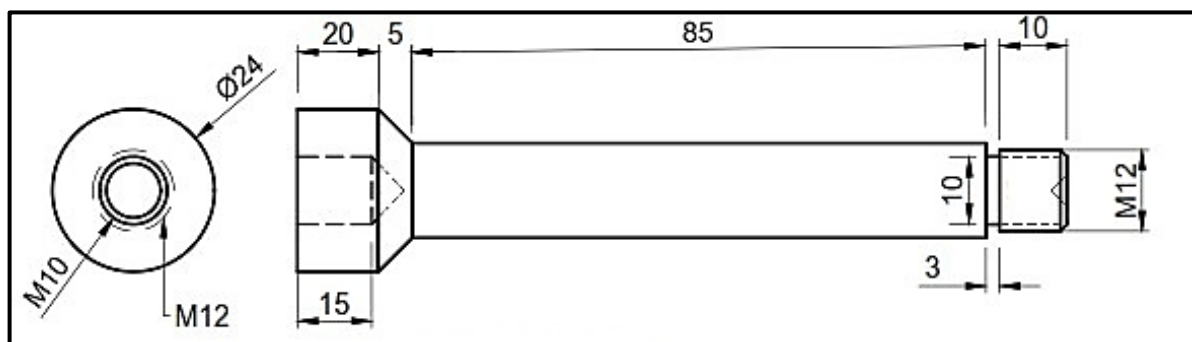
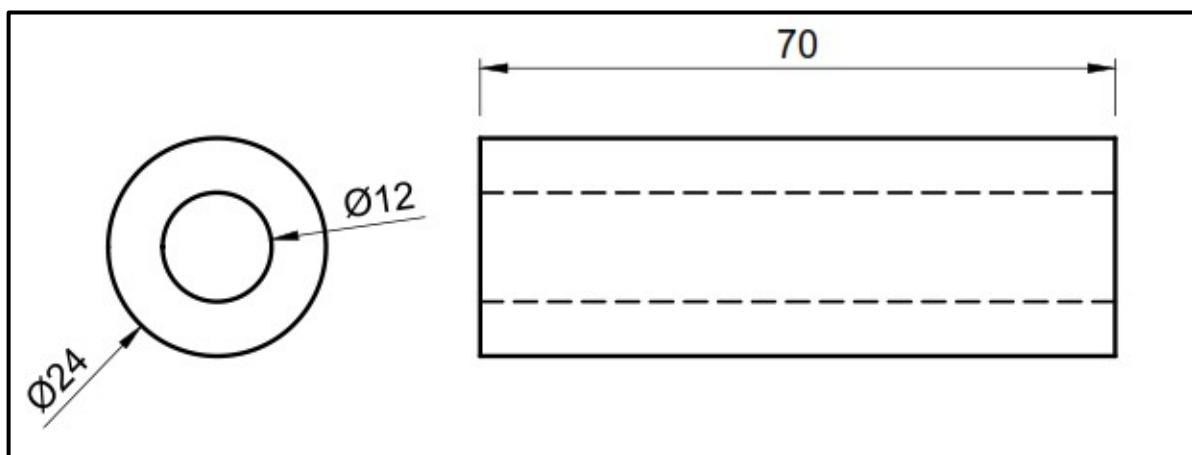
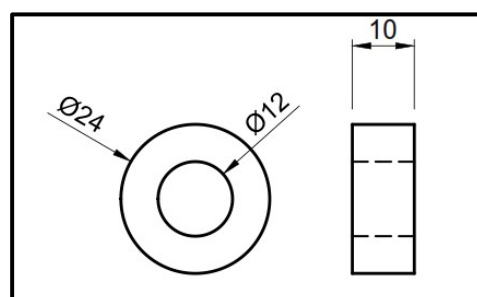
(5)

NOTE: This worksheet MUST be available in the candidate's portfolio of evidence.

MECHANICAL TECHNOLOGY							
FITTING AND MACHINING							
MARK SHEET – SOFT-FACE HAMMER HEAD – PHASE 2							
GRADE	12	DATE					
PROJECT	COMBINATION OF SOFT-FACE AND CROSS-PEEN HAMMERS						
CANDIDATE'S NAME							
FACETS	MARKS	Candidate – Self-assessment	Teacher Assessment	Internal Moderation	Provincial Moderation	External Moderation	TEACHER'S COMMENTS
		1	2	3	4	5	
Machine to Ø35 mm	5						
Head length to 60 mm	5						
Mill flat side, on centre line 16 mm wide	5						
Calculate taper for compound slide setting (Worksheet 2.1)	5						
Cut 2 x tapers	10						
Drill holes for inserts to Ø13 mm	10						
Drill hole Ø10,2 mm for tapping according to required dimensions	5						
Tap M12 x 1,75 to fit handle according to correct requirements	5						
Finishing	5						
Subtotal:	55						
PHASE 2 TOTAL:	50						
MODERATOR'S COMMENTS:							
NAME AND SIGNATURE OF CANDIDATE							
NAME AND SIGNATURE OF TEACHER							
NAME AND SIGNATURE OF TECHNICAL DEPARTMENTAL HEAD							
NAME AND SIGNATURE OF PROVINCIAL MODERATOR							
NAME AND SIGNATURE OF EXTERNAL MODERATOR							

PHASE 3: SOFT-FACE HAMMER INSERTS**July–August 2026****FIGURE 12: SOFT-FACE HAMMER INSERTS – TWO MUST BE MANUFACTURED**

MECHANICAL TECHNOLOGY								
FITTING AND MACHINING								
MARK SHEET – HAMMER INSERTS – PHASE 3								
GRADE		12	DATE					
PROJECT		COMBINATION OF SOFT-FACE AND CROSS-PEEN HAMMERS						
CANDIDATE'S NAME:								
FACETS		MARKS	Candidate – Self-assessment	Teacher Assessment	Internal Moderation	Provincial Moderation	External Moderation	TEACHER'S COMMENTS
			1	2	3	4	5	
INSERT 1	Ø24 mm	5						
	Ø24 length to 20 mm	5						
	Ø13,1 mm	5						
	Ø13,1 length to 15 mm	5						
	Finishing	5						
INSERT 2	Ø24 mm	5						
	Ø24 length to 20 mm	5						
	Ø13,1 mm	5						
	Ø13,1 length to 15 mm	5						
	Finishing	5						
PHASE 3 TOTAL:		50						
MODERATOR'S COMMENTS:								
NAME AND SIGNATURE OF CANDIDATE								
NAME AND SIGNATURE OF TEACHER								
NAME AND SIGNATURE OF TECHNICAL DEPARTMENTAL HEAD								
NAME AND SIGNATURE OF PROVINCIAL MODERATOR								
NAME AND SIGNATURE OF EXTERNAL MODERATOR								

PHASE 4: HANDLE
January–August 2026**FIGURE 13: SCREW****FIGURE 14: SHAFT****FIGURE 15: HANDLE****FIGURE 16: INSERTS – TWO MUST BE MANUFACTURED**

MECHANICAL TECHNOLOGY								
FITTING AND MACHINING								
MARK SHEET – HANDLE – PHASE 4								
GRADE		12	DATE					
PROJECT		COMBINATION OF SOFT-FACE AND CROSS-PEEN HAMMERS						
CANDIDATE'S NAME:								
FACETS		MARKS	Candidate – Self-assessment	Teacher Assessment	Internal Moderation	Provincial Moderation	External Moderation	TEACHER'S COMMENTS
			1	2	3	4	5	
SCREW	Ø24 mm	5						
	Ø24 length to 10 mm	5						
	Ø 11,90 mm	5						
	Ø12 length to 90 mm	5						
	Ø10 mm	5						
	3 mm groove to Ø8,5 mm	5						
	Ø10 length to 10 mm	5						
	Cut M10 x 1,5 screw thread	5						
	Knurling	5						
	Finishing	5						
SHAFT	Ø24 mm	5						
	Ø24 length to 20 mm	5						
	Ø14 mm	5						
	Ø14 length to 85 mm	5						
	Chamfer 5 mm length to 45°	5						
	Ø12 mm	5						
	3 mm groove to Ø 10 mm	5						
	Ø12 length to 10 mm	5						
	Cut M12 x 1,75 screw thread	5						
	Drill Ø8,5 mm hole for tapping	5						
	Tap M10 x 1,5 thread to 15 mm deep	5						
	Finishing	5						

HANDLE	Ø24 mm		5						
	Ø24 length to 70 mm		5						
	Drill hole Ø12 mm through		5						
	Finishing		5						
INSERT RINGS	RING 1	Ø24 mm	5						
		Ø24 length to 10 mm	5						
		Drill hole Ø12 mm through	5						
		Finishing	5						
	RING 2	Ø24 mm	5						
		Ø24 length to 10 mm	5						
		Drill hole Ø12 mm through	5						
		Finishing	5						
ASSEMBLY	Press fit soft face inserts into head		10						
	Correct assembly of handle with inserts		5						
	Soft-face head fits on handle		5						
	Cross-peen head fits on handle		5						
	Final finishing		5						
Subtotal:			200						
PHASE 4 TOTAL:			100						
MODERATOR'S COMMENTS:									
NAME AND SIGNATURE OF CANDIDATE									
NAME AND SIGNATURE OF TEACHER									
NAME AND SIGNATURE OF TECHNICAL DEPARTMENTAL HEAD									
NAME AND SIGNATURE OF PROVINCIAL MODERATOR									
NAME AND SIGNATURE OF EXTERNAL MODERATOR									

MECHANICAL TECHNOLOGY											
FITTING AND MACHINING											
COMPOSITE MARK SHEET – TOTALS											
GRADE		12	DATE								
PROJECT		COMBINATION OF SOFT-FACE AND CROSS-PEEN HAMMERS									
		CANDIDATES									
PHASES	MARKS										
		1	2	3	4	5	6	7	8	9	10
PHASE 1	50										
PHASE 2	50										
PHASE 3	50										
PHASE 4	100										
TOTAL:	250										
TOTAL PAT MARK:	100										
NAME AND SIGNATURE OF TEACHER											
NAME AND SIGNATURE OF TECHNICAL DEPARTMENTAL HEAD											
NAME AND SIGNATURE OF SCHOOL PRINCIPAL											
NAME AND SIGNATURE OF PROVINCIAL MODERATOR											
NAME AND SIGNATURE OF EXTERNAL MODERATOR											

SCHOOL STAMP

5. CONCLUSION

On completion of the practical assessment task candidates should be able to demonstrate their understanding of the industry, enhance their knowledge, skills, values and reasoning abilities as well as establish connections to life outside the classroom and address real-world challenges. The PAT furthermore develops the candidate's life skills and provides opportunities for candidates to engage in their own learning.