STAPEL

education

Department of Education
FREE STATE PROVINCE

PROVINSIALE VRAESTEL
PROVINCIAL PAPER

GRAAD 12
GRADE 12

ENGINEERING GRAPHICS AND DESIGN P2

JUNE 2018

MARKS: 100
TIME: 3 HOURS

This question paper consist of 6 pages

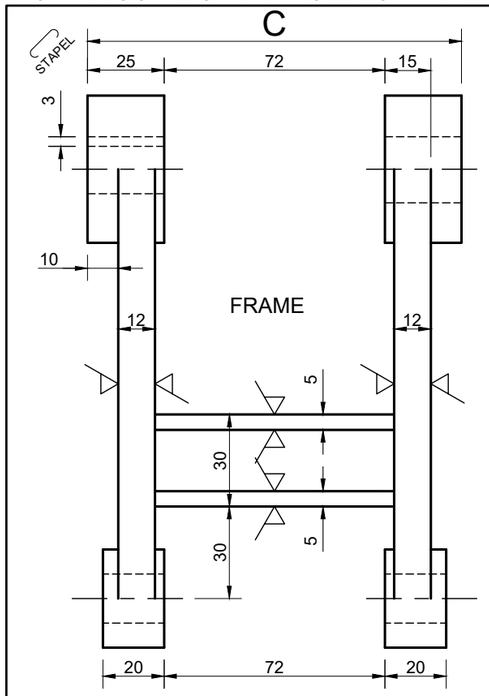
INSTRUCTIONS AND INFORMATION

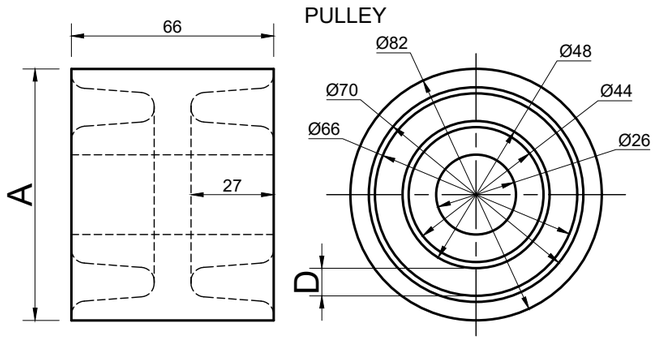
1. This question paper consist of FOUR questions
2. Answer ALL the questions.
3. ALL drawings are in third-angle orthographic projection, unless stated otherwise.
4. ALL drawings must be drawn to scale 1:1, unless stated otherwise.
5. ALL questions must be answered on the DIAGRAM SHEETS, as instructed.
6. ALL the pages must be restapled in numerical sequence, irrespective of whether the question was attempted or not.
7. Time management is essential in order to complete all the questions.
8. Print your name and surname as well as the grade in the space provided on each page.
9. ALL answers must be drawn accurately and neatly.
10. ALL necessary construction and projection lines must be shown.
11. Plan each drawing carefully from the given position, which is indicated on the diagram sheets.
12. Any details or dimensions not given must be assumed in good proportion.

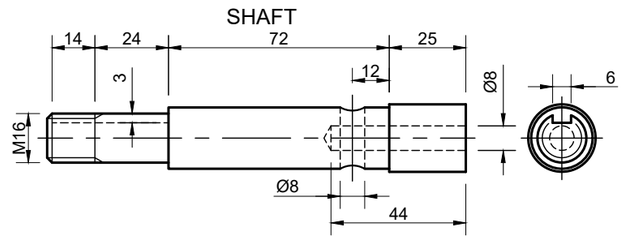
FOR OFFICIAL USE ONLY								
QUESTION	MARKS OBTAINED			½	MODERATED			½
1								
2								
3								
4								
TOTAL								
	2	0	0		2	0	0	

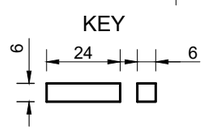
FINAL CONVERTED MARK	CHECKED BY
100	

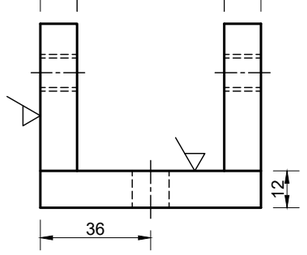
NAME & SURNAME	MEMORANDUM	GRADE	12	1

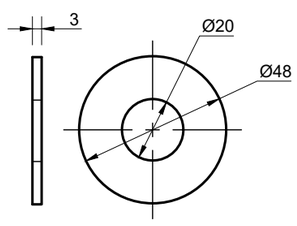


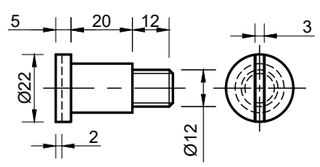


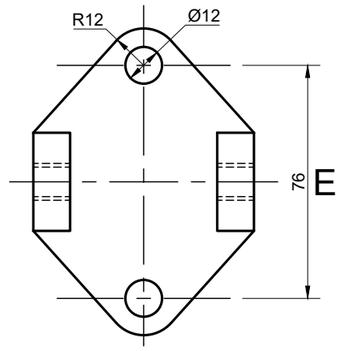


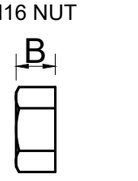


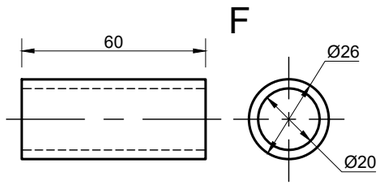












QUESTION 1: ANALYTICAL (MECHANICAL)

Given:
The working drawings of a BELT TENSION device in third-angle-orthographic-projection with a title block and a table of questions.

Instructions:
With a pencil, neatly print the correct answers in the corresponding answer column. All the questions refer to the accompanying drawings and the title block on diagram sheet 1. **[31]**

QUESTIONS		ANSWERS			
1	On what date was the drawing checked?	2017/05/20	1		
2	What material is used to manufacture the parts?	Cast iron	1		
3	What is the manufacture's web address?	www.jdvdb.co.za	1		
4	How many sets of drawings are there for this belt tensioner?	4	1		
5	How many sets of drawings of these parts, have been signed?	3	1		
6	How many surfaces must be machined?	10	1		
7	Who revised the drawing?	Jan-Hendrik	1		
8	On which date was the drawing revised?	2017/05/13	1		
9	Determine the dimensions at:	**A:** Ø82 **B:** 12.8 **C:** 122 **D:** 9	4		
10	What will the dimension at E be, if the scale is 5 : 1?	76	2		
11	What kind of part is F?	Bush	1		
12	What kind of key must be used?	24 x 6 x 6 OR Square key	2		
13	What drawing program is used?	AutoCad 2018	1		
14	How many parts are there in this assembly?	9	1		
15	How many of each part must be manufactured?	100	1		
16	What is the formula to calculate the size of a screw thread?	D x 0.1 OR Ø/10	2		
17	With reference to the tolerance, determine the maximum dimension of 20 mm.	20.15	2		
18	With reference to the tolerance, determine the minimum dimension of 20 mm.	19.85	2		
19	In the space below (ANSWER 19), draw, in neat freehand, the symbol for the projection system used.		5		
	TOTAL		31		

MATERIAL: CAST IRON
QUANTITY: 100

UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS ARE ± 0.15.

MILLING

ALL DIMENSIONS ARE IN MILLIMETERS

DRAWN: CJ
DATE: 26/04/2017

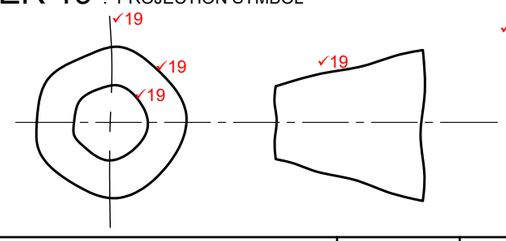
ALL UNSPECIFIED RADII ARE R4.5

CHECKED: CAU
DATE: 20/05/2017

DRAWING PROGRAM: AUTOCAD 2018

APPROVED: SCHALK
DATE: 28/05/2017

ANSWER 19 : PROJECTION SYMBOL



FREEHAND ✓19

SCALE 1 : 1	HEAT TREATMENT : NONE	TITLE: BELTTENSIONER
FILE NAME: JD/2018	DRAWING SET NO.3 OF 4	
VD BERGS ENGINEERING WORKS CHURCH STREET WELKOM 9460 www.jdvdb.co.za		

DATE	CHANGED BY	REVISION DESCRIPTION
13/05/2017	JAN-HENDRIK	INSERT KEY

DIAGRAM SHEET 1	ENGINEERING GRAPHICS AND DESIGN	JUNE 2018 - PAPER 2	NAME & SURNAME	MEMORANDUM	GRADE 12 2

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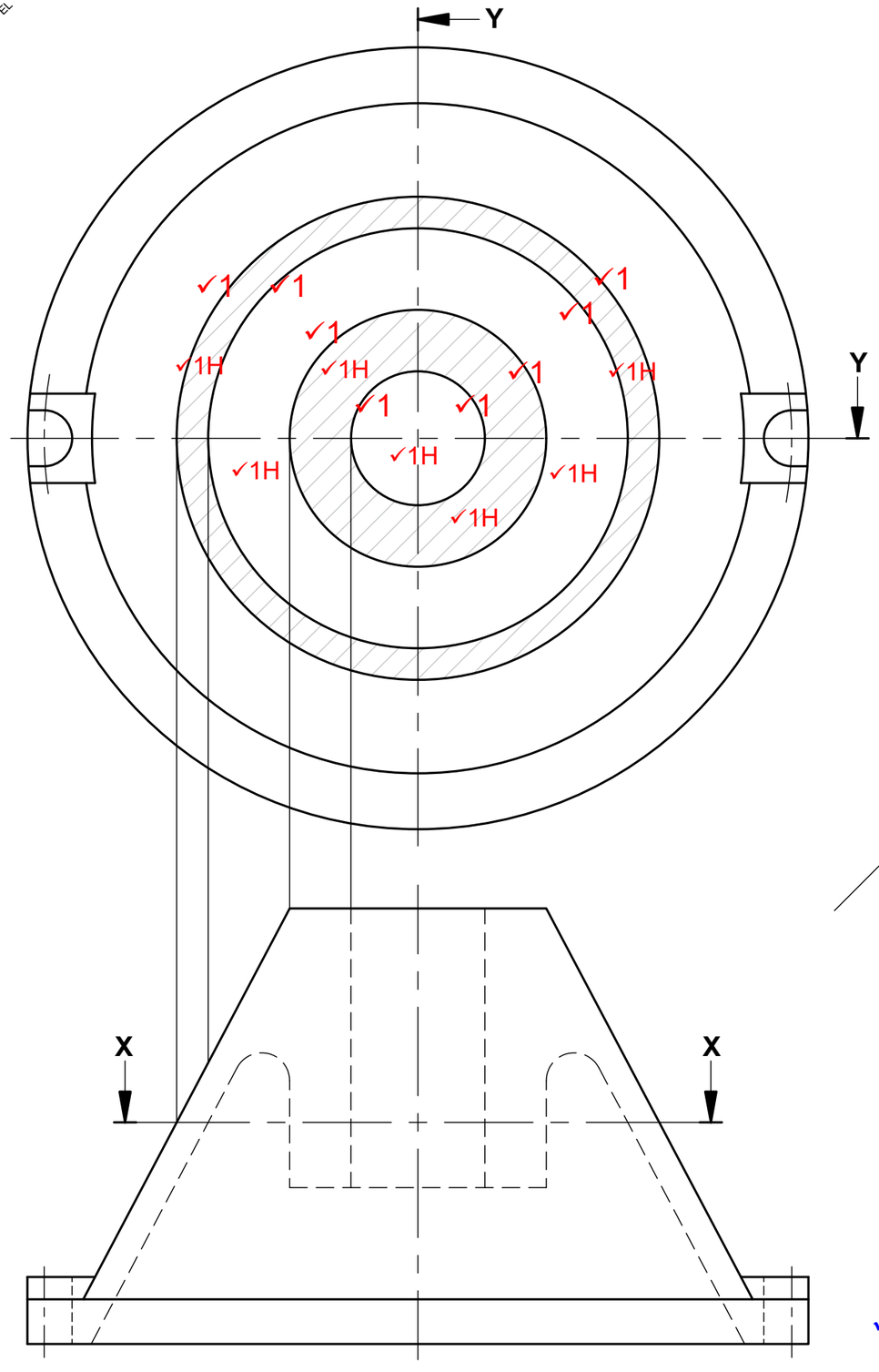

QUESTION 2: MECHANICAL SECTION

Given:

- The incomplete top view.
- The complete front view.
- The center line of the right view.

Instructions:

Complete, according to scale 1:1, the following:

2.1 A sectional top view according to cutting plane X-X.

2.2 A half-sectional right view according to cutting plane Y-Y.

Note:

- NO hidden detail is required. **[36]**

ASSESSMENT CRITERIA					
1	TOP VIEW ✓1	15			
2	RIGHT VIEW ✓2	21			
TOTAL		36			

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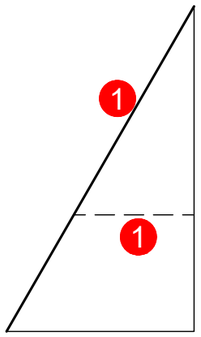
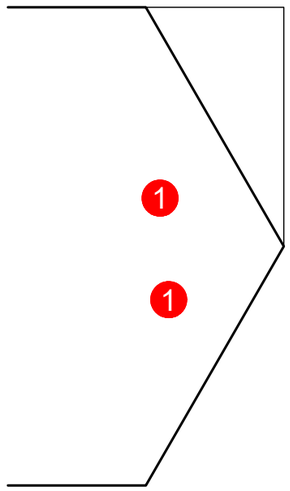
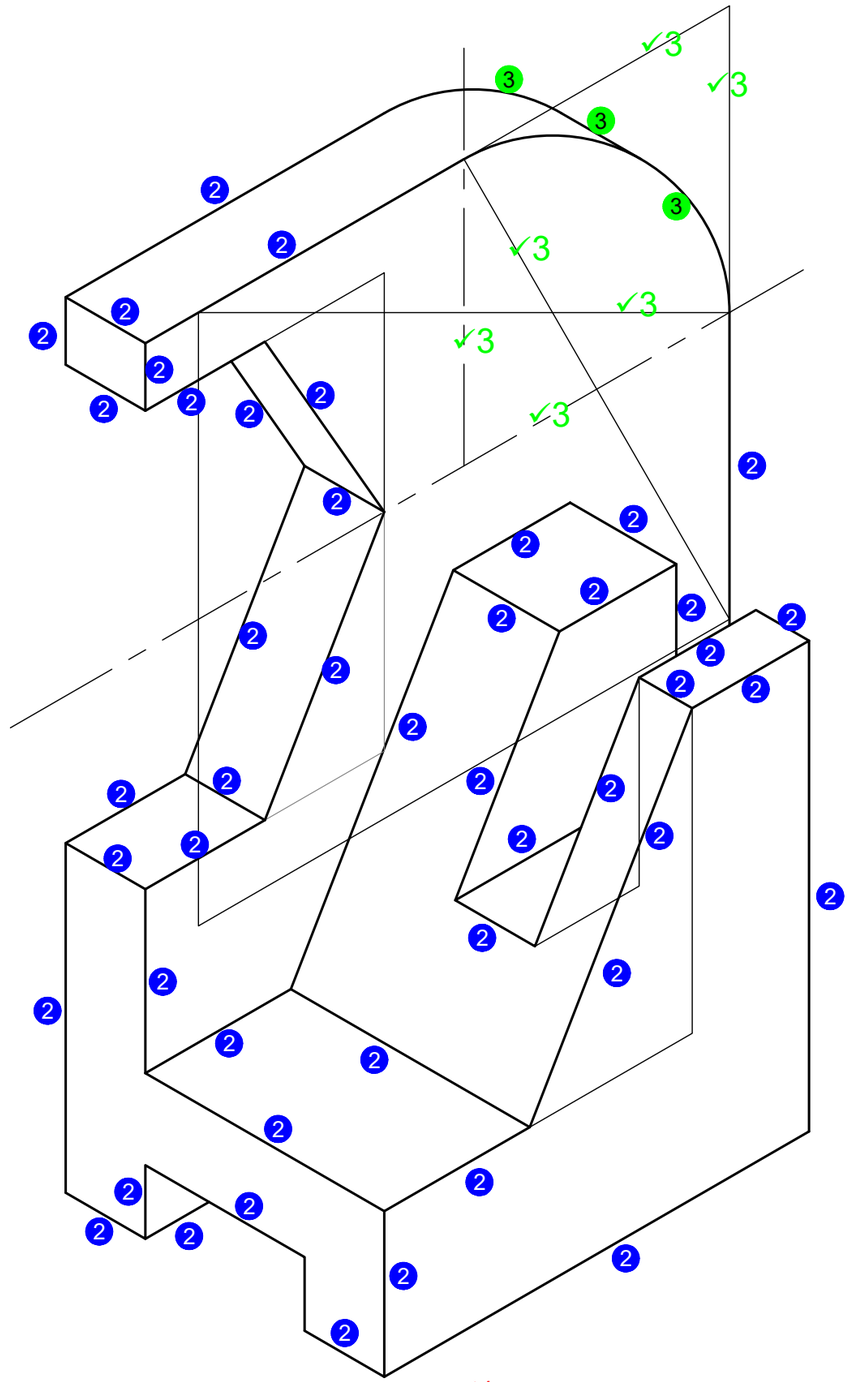




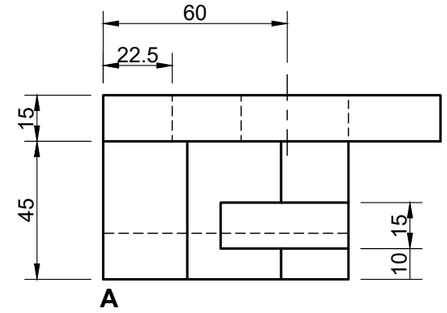


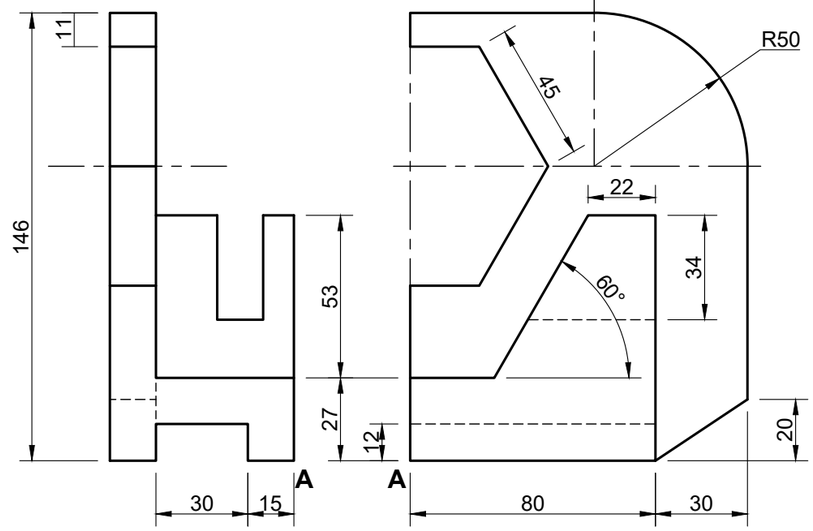
QUESTION 3: ISOMETRIC DRAWING

Given:
The front view, top view and left view of a casting.
The position of point A on diagram sheet 3 (page 4).

Instructions:
Use scale of 1:1 to convert the orthographic view of the casting into an isometric drawing.

- Make A the lowest point of the drawing.
- Show ALL necessary constructions.
- NO hidden detail is required. **[35]**





ASSESSERINGSKRITERIA					
1	PLACEMENT ✓1		2		
2	AUXILIARY VIEW(S) ($\frac{4}{2}$) 1		2		
3	ISO- + NON-ISOMETRIC LINES ($\frac{47}{2}$) 2		23.5		
4	CIRCLE + CONST + SL (Full) ✓3 ($\frac{1}{2}$) 3		7.5		
TOTAL			35		

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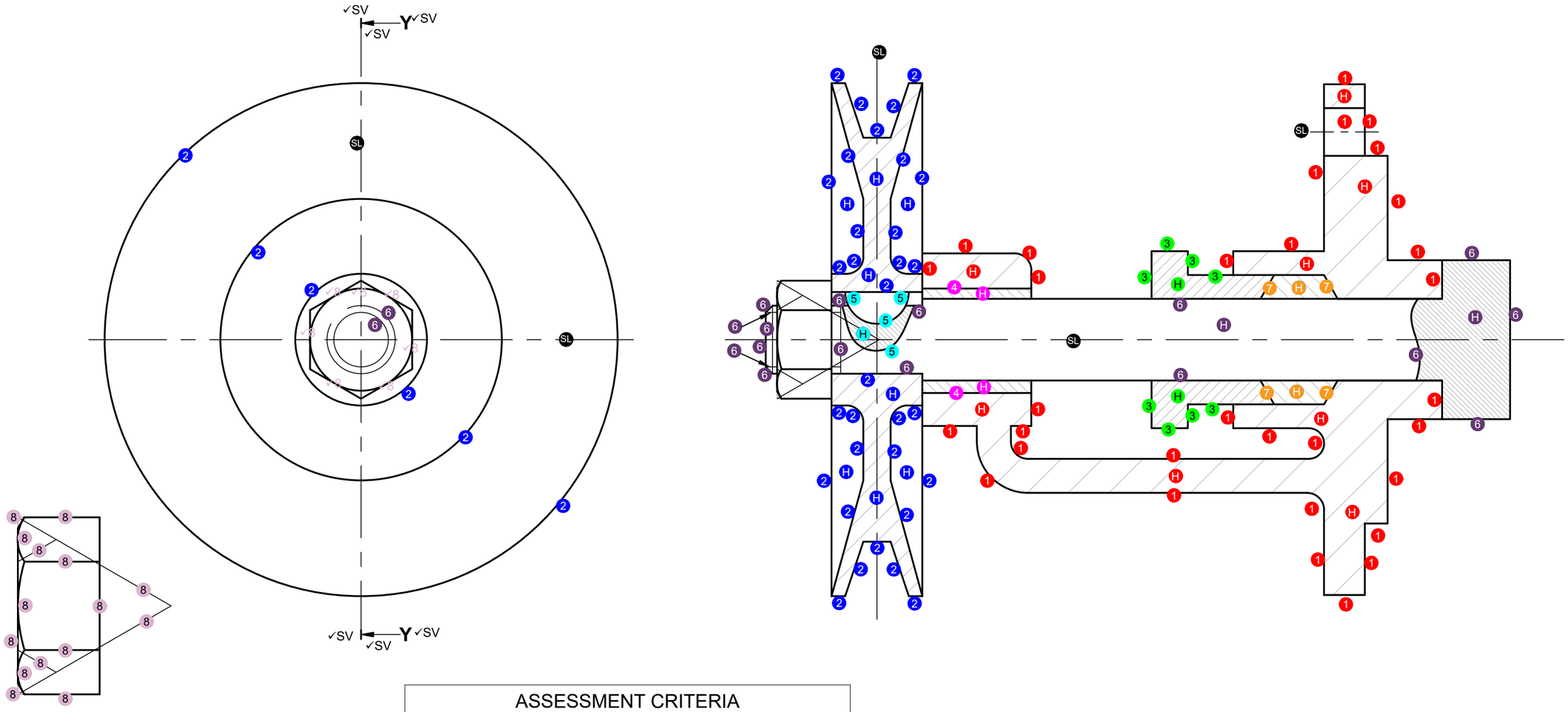

ASSESSMENT CRITERIA				
LEFT VIEW			Mark	Mod.
2	V-PULLEY ($\frac{6}{2}$) ②	3		
6	SHAFT ($\frac{2}{2}$) ⑥	1		
8	M15-NUT ⑧	7		
	SUB TOTAL 1	11		

ASSESSMENT CRITERIA				
SECTIONAL FRONT VIEW			Mark	Mod.
1	BODY ($\frac{40}{2}$) ①	20		
2	V-PULLEY ($\frac{40}{2}$) ②	20		
3	GLAND ($\frac{10}{2}$) ③	5		
4	BUSH ($\frac{4}{2}$) ④	2		
5	WOODRUFF KEY ($\frac{5}{2}$) ⑤	2.5		
6	SHAFT ($\frac{18}{2}$) ⑥	9		
7	PACKING ($\frac{6}{3}$) ⑦	3		
8	M15-NUT ($\frac{15}{2}$) ⑧	7.5		
	SUB TOTAL 2	69		

ASSESSMENT CRITERIA				
TECHNICAL PROVISION			Mark	Mod.
1	CENTER LINES SL	5		
2	CUTTING PLANE Y-Y ($\frac{6}{2}$) ✓CP	3		
3	TITLE ✓T	2		
	SCALE ✓S	2		
4	PROJECTION SYMBOL ✓PS	6		
	SUB TOTAL 3	18		
	GRAND TOTAL	98		

TITLE
CENTRIFUGAL PUMP ✓T ✓T
SCALE
SCALE 1:1 ✓S ✓S
PROJECTION SYMBOL

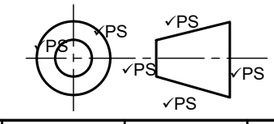

DIAGRAM SHEET 5	ENGINEERING GRAPHICS AND DESIGN	JUNE 2018 - PAPER 2	NAME & SURNAME	MEMORANDUM	GRADE 12 6