



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

**Junior Certificate 2017**

**Marking Scheme**

**Technical Graphics**

**Ordinary Level**

## **Note to teachers and students on the use of published marking schemes**

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

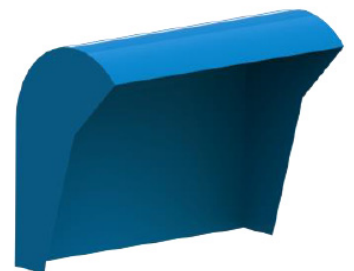
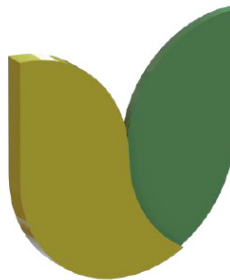
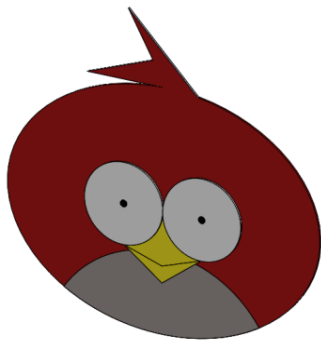
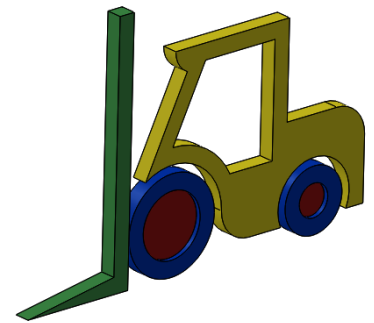
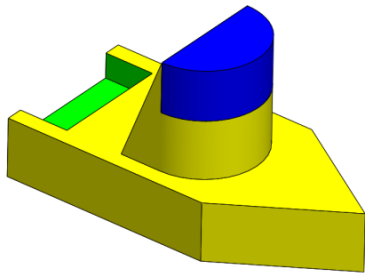
## **Future Marking Schemes**

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.



***Junior Certificate Examination 2017***

***Technical Graphics***  
***Ordinary Level***



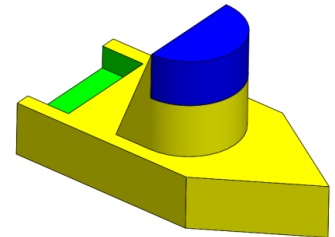
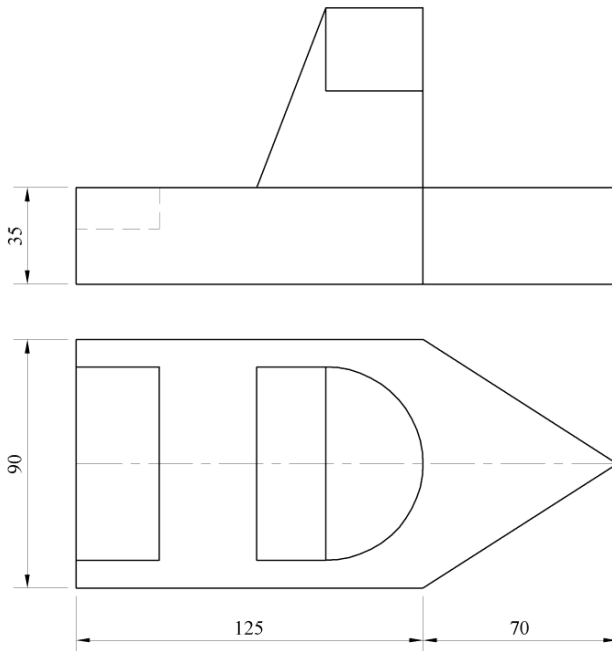
***Marking Scheme***  
***Section A and B***

## Section A – Any ten questions from this section

<b>Q1</b>	2 10	Any 2 Projection lines from End View <b>(2 marks)</b> Elevation – 5 lines – <b>(5 x 2 marks)</b> (-1 mark if hidden detail is not shown)
<b>Q2</b>	8 4	For a good quality, well proportioned freehand pictorial sketch <b>(5 marks for average quality or rule used)</b> For colour or shading
<b>Q3</b>	6 6	Correct identification – USB pen drive, CD <b>(3 marks each)</b> Advantage <b>(6 marks)</b>
<b>Q4</b>	2 2 8	Circle – <b>(2 marks)</b> Vertical, horizontal and diagonal construction lines <b>(4 x .5 mark)</b> Completion – 8 lines <b>(8 x 1 mark)</b>
<b>Q5</b>	6 2 4	Correct location of F and F1 <b>(2 x 3 marks)</b> Diagonal line <b>(2 marks)</b> Rectangle outline <b>(4 x 1 mark)</b>
<b>Q6</b>	8 4	16 lines - <b>(16 x 0.5mark)</b> For colour or shading <b>(4 marks)</b>
<b>Q7</b>	12	39 – 41 sq. units = 12 marks <b>(38 or 42 = 6 marks)</b>
<b>Q8</b>	6 6	A = 180 <b>(6 marks)</b> B = 90 <b>(6 marks)</b>
<b>Q9</b>	12	Correct elevation of blocks = A <b>(12 marks)</b>
<b>Q10</b>	6 4 2	Tangent construction, line to centre <b>(2 marks)</b> , semi-circle <b>(4 marks)</b> Tangent line <b>(4 marks)</b> Point of contact <b>(2 marks)</b>
<b>Q11</b>	12	Any two commands <b>(2 x 6 marks)</b> Rectangle, Trim, Extrude boss/base
<b>Q12</b>	6 6	Correct division of circle <b>(6 marks)</b> Shade three sectors <b>(3 x 2 marks)</b>
<b>Q13</b>	6 6	2 Arcs <b>(2 x 3 marks)</b> 3 Lines <b>(3 x 2 marks)</b>
<b>Q14</b>	12	6 lines – 2 marks per line <b>(6 x 2 marks)</b> (-1 mark each line incorrect)
<b>Q15</b>	6 2 4	6 Lines <b>(6 x 1 mark)</b> Quadrant <b>(2 marks)</b> For colour or shading
<b>Total 120</b>		

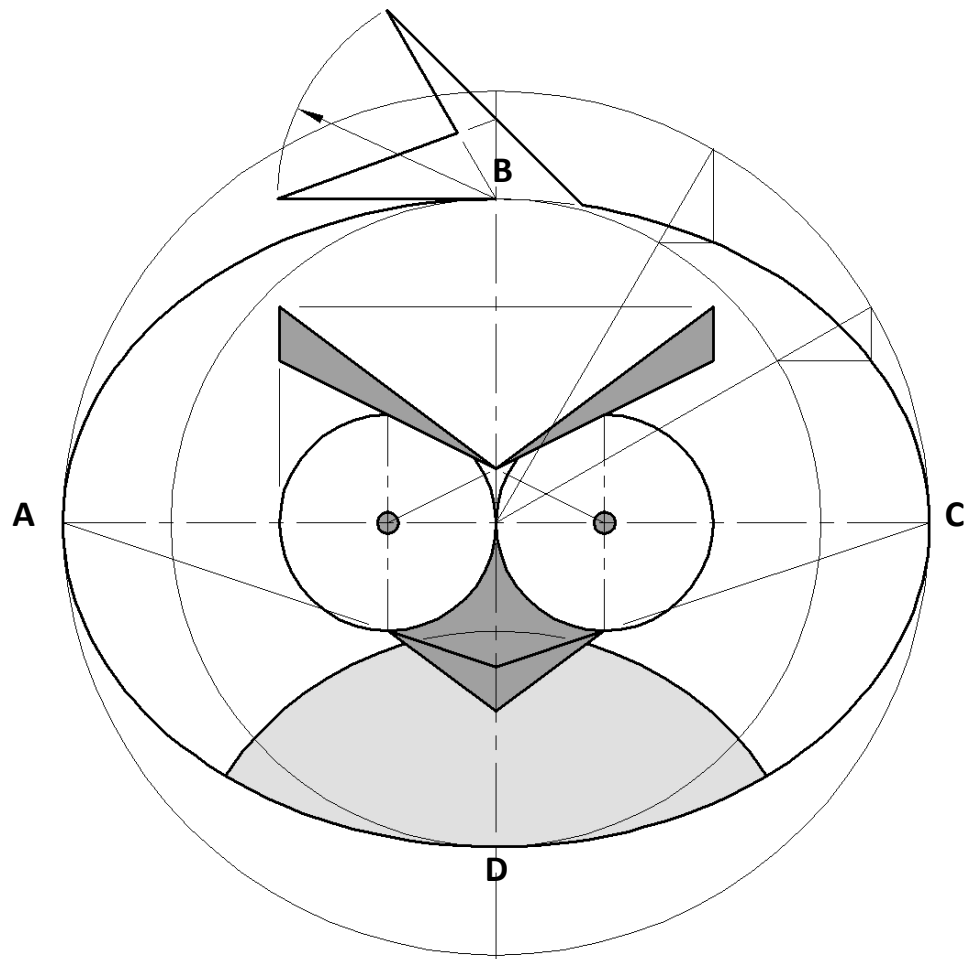
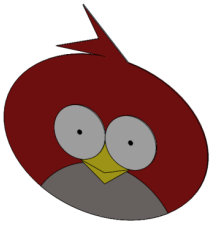
# Section B — Any four questions from this section

## Q1: Orthographic Projection



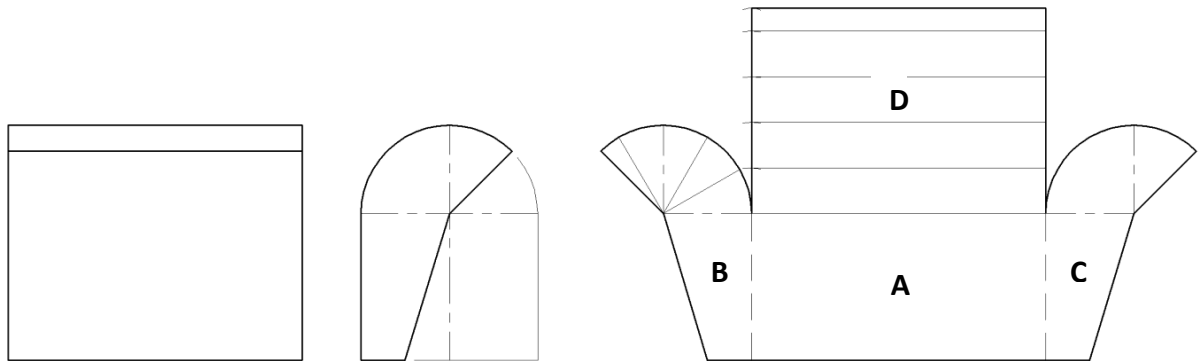
<b>Orthographic Outline (10)</b>	
10	Elevation and Plan positioned correctly (4 marks if Plan is incorrectly positioned, 1 view = 3 marks)
<b>Elevation (20)</b>	
10	Hull – 5 lines ( <b>5 x 2marks</b> )
6	Cabin ( <b>3 x 2 marks</b> )
2	Cabin window ( <b>2 x 1 mark</b> )
2	Hidden detail – 2 lines ( <b>2 x 1 mark</b> )
<b>Plan (24)</b>	
7	Hull – Hor/Vert ( <b>3 x 1 mark</b> ), Inclined lines ( <b>2 x 2 marks</b> )
11	Cabin – Semi-circle ( <b>3 marks</b> ), 4 lines ( <b>4 x 2 marks</b> )
6	Back deck – 3 lines ( <b>3 x 2 marks</b> )
<b>Dimension lines (4)</b>	
4	1 mark per dimension ( <b>4 x 1 mark</b> )
(12)	Drafting, accuracy, and presentation
<b>Total 70</b>	

## Q 2: Ellipse



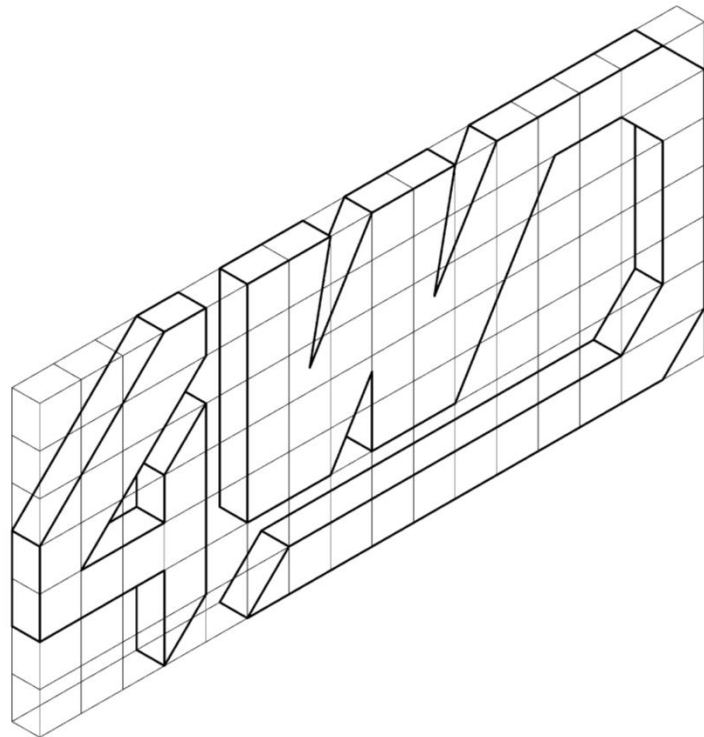
<b>Ellipse construction (24)</b>	
6	<b>Ellipse; Major AC; minor BD – (2 x 3 marks)</b>
10	<b>Construction for ellipse (incorrect application = 4 marks)</b>
8	<b>Drawing curve of ellipse ABCD (8,6,4, depending on quality)</b>
<b>Face completion (34)</b>	
5	<b>Eyes 2 circles (2 x 2 marks), pupils (1 mark)</b>
11	<b>Mouth – 4 lines (4 x 2 marks), Arc (3 marks)</b>
10	<b>Eye brows – 4 sloped lines (4 x 2 marks), 2 vertical lines (2 x 1 mark)</b>
8	<b>Hair – 4 lines (4 x 2 marks)</b>
(12)	<b>Drafting, accuracy, and presentation</b>
<b>Total 70</b>	

### Q 3: Surface Development



<b>Orthographic (20)</b>	
4	Elevation and End View in correct position <b>(End view in wrong location or 1 view = 2 marks)</b>
7	Elevation: 4 lines for outline <b>(4 x 1 mark)</b> Roof edge <b>(3 marks)</b>
9	End View: Semi-circle <b>(3 marks)</b> , 2 lines <b>(2 x 1 mark)</b> , Sloping lines <b>(2 x 2 marks)</b>
<b>Development (38)</b>	
8	Back <b>A</b> – 4 lines <b>(4 x 2 mark)</b>
16	Side <b>B + C</b> – Base line <b>(1 mark)</b> , semi-circle <b>(3 marks)</b> and 2 sloping lines <b>(2 x 2 marks)</b>
6	Construction for finding correct length of side <b>D</b> <b>(6 marks)</b>
6	Side <b>D</b> – 3 lines <b>(3 x 2 mark)</b>
2	Fold lines <b>(2 x 1 mark)</b>
(12)	Drafting, accuracy, and presentation
<b>Total 70</b>	

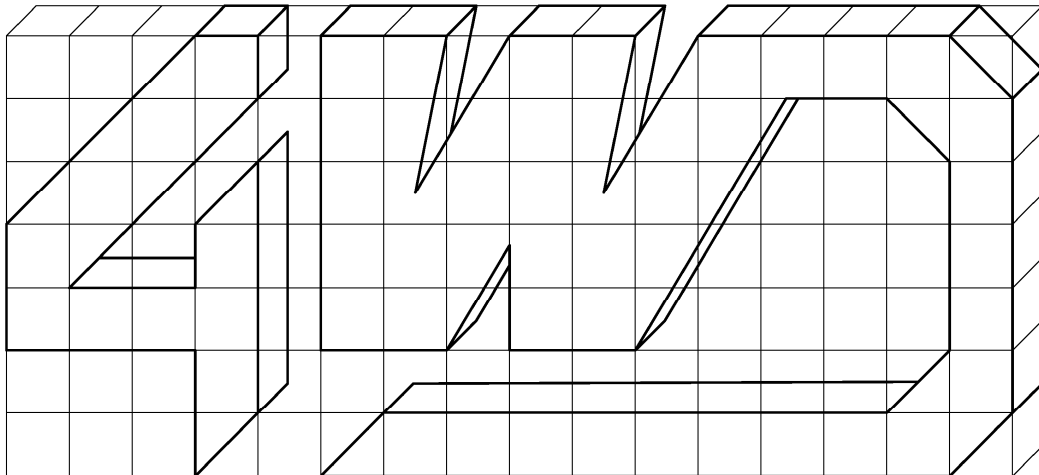
## Q 4: Isometric Projection



<b>Setting Up (16)</b>	
12	Height, length, and width of grid ( <b>3 × 4 marks</b> ) <b>(deduct 2 each if inaccurate)</b>
4	Isometric outline ( <b>deduct 2 + 2 if 30° angles are not used</b> )
<b>Front Face (24)</b>	
8	Number <b>4</b> – 12 lines (Two thirds mark each line)
8	Letter <b>W</b> – 12 lines (Two thirds mark each line)
8	Letter <b>D</b> - 11 lines (Two thirds mark each line)
<b>Complete width (18)</b>	
18	6 marks per element, Number <b>4</b> , Letter <b>W</b> , and Letter <b>D</b> <b>(4 marks per element if all lines are not put in)</b>
(12)	Drafting, accuracy, and presentation
<b>Total 70</b>	

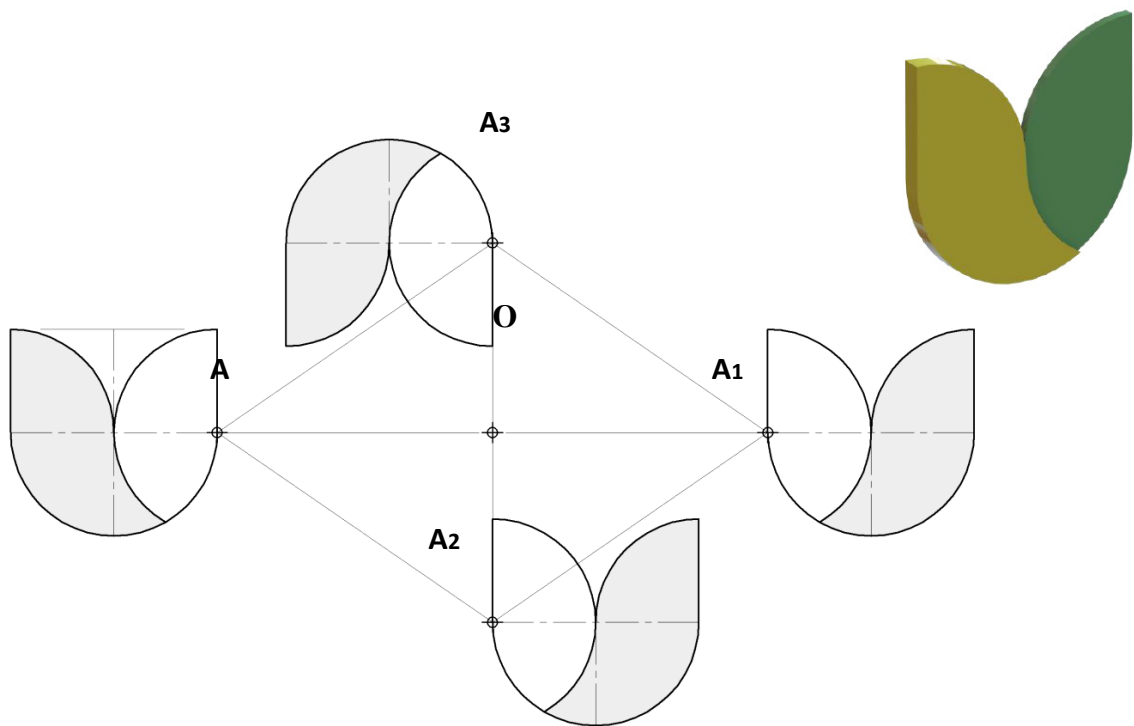


## Q 4: Oblique Projection



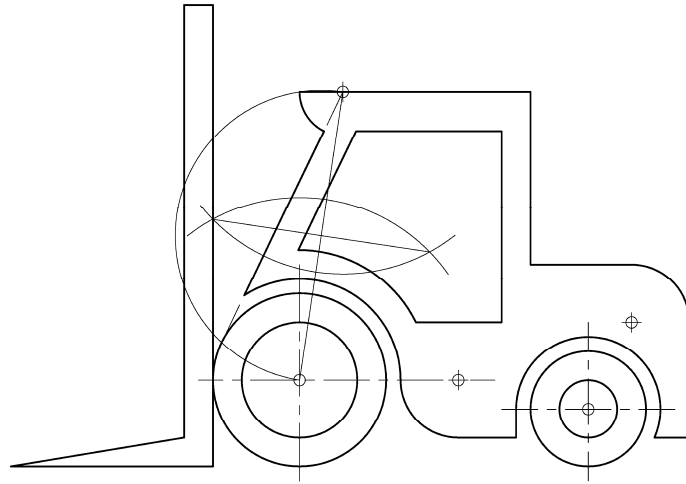
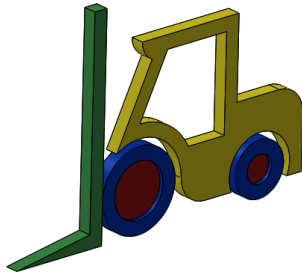
<b>Setting Up (16)</b>	
12	Height, length and width of grid ( <b>3 × 4 marks</b> ) <b>(deduct 2 each if inaccurate)</b>
4	Oblique outline ( <b>deduct 4 marks if 45° angle are not used</b> )
<b>Front Face (24)</b>	
8	Number <b>4</b> – 12 lines (Two thirds mark each line)
8	Letter <b>W</b> – 12 lines (Two thirds mark each line)
8	Letter <b>D</b> - 11 lines (Two thirds mark each line)
<b>Complete width (18)</b>	
18	6 marks per element, Number <b>4</b> , Letter <b>W</b> and Letter <b>D</b> <b>(4 marks per element if all lines are not put in)</b>
(12)	Drafting, accuracy and presentation
<b>Total 70</b>	

## Q 5: Transformation Geometry



<b>Setting Up (16)</b>	
10	Draw given logo: 3 arcs ( <b>3 x 2 marks</b> ), 2 lines ( <b>2 x 2 marks</b> )
4	Locate points A, A1, A2, A3 ( <b>4 x 1 mark</b> )
2	Locate point O ( <b>2 marks</b> )
<b>Axial Symmetry (14)</b>	
4	Projection lines perpendicular to A2-A3 ( <b>correct position and orientation</b> )
10	Drawing florist logo
<b>Translation (14)</b>	
4	Projection parallel to A1-A2 ( <b>correct position and orientation</b> )
10	Drawing florist logo
<b>Central Symmetry (14)</b>	
4	Drawing lines through centre of point O ( <b>correct position and orientation</b> )
10	Drawing florist logo
(12)	Drafting, accuracy and presentation
<b>Total 70</b>	

### Q6: Circles



<b>Outline Constructions (16)</b>	
6	R30 circle, inner rim R20 <b>(3 marks + 3 marks)</b>
10	Rear wheel – Position, R20 circle, inner rim R10 <b>(4 marks + 3 marks + 3 marks)</b>
<b>Rear body outline (9)</b>	
9	Baselines <b>(2 x 1 mark)</b> , R25 wheel arc <b>(2 marks)</b> , 2 vertical lines <b>(2marks)</b> , R20 quadrant <b>(2 marks)</b> , top horizontal line <b>(1 mark)</b>
<b>Front body outline (8)</b>	
8	R20 and location of centre <b>(2 marks + 4 marks)</b> , R35 arc <b>(2 marks)</b>
<b>Cab outline (12)</b>	
4	Vertical and horizontal outline <b>(2 x 1 mark)</b> , R15 circle <b>(2 marks)</b>
8	Tangent construction <b>(4 marks)</b> , Tangent line <b>(2 marks)</b> , point of contact <b>(2 marks)</b>
<b>Window (7)</b>	
2	R45 arc <b>(2 marks)</b>
5	Offsets <b>(3 x 1 mark)</b> parallel line <b>(2 marks)</b>
<b>Forks (6)</b>	
6	Horizontal and vertical lines <b>(4 x 1 mark)</b> , sloped line <b>(2 marks)</b>
(12)	Drafting, accuracy and presentation
<b>Total 70</b>	