



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2011

Marking Scheme

Design and Communication Graphics

Ordinary Level



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***Design and Communication
Graphics
Ordinary Level***



***Marking Scheme
and Sample Solutions***

(Other valid solutions are acceptable and are marked accordingly)

QUESTION A-1

MARKS

Axonometric Projection (18)

- (i) Perp. projections from plan(3x1,2).....5
- (ii) Perp. projections from elevation(3x1,2).....5
- (iii) Identify points on the axonometric projection3
- (iv) Complete the axonometric projection5
- (v) *Presentation*2

Total = 20

QUESTION A-2

MARKS

(a) Completion of elevation (10)

- (i) Perp. projections to elevation2
- (ii) Identify points in elevation5
- (iii) Complete elevation3

(b) True angle (8)

- (iv) Projections from plan3
- (v) Heights from elevation2
- (vi) Complete the auxiliary elevation3
- (vii) *Presentation*2

Total = 20

QUESTION A-3

MARKS

(a) Semi-Parabola (13)

- (i) Complete division of BC2
- (ii) Complete division of CV2
- (iii) Construction lines (2 sets)(2,2)4
- (iv) Identify points on curve2
- (v) Draw curve3

(b) Reflection of Semi-Parabola (5)

- (vi) Locate points on curve2
- (vii) Draw curve3
- (viii) *Presentation*2

Total = 20

QUESTION A-4

MARKS

(a) Cylinder B (11)

- (i) Projection of centre from plan3
- (ii) Establish the centre point in elevation4
- (iii) Draw cylinder B4

(b) Cylinder C (7)

- (iv) Projection of centre from elevation2
- (v) Locate centre point in plan2
- (vi) Draw cylinder C3
- (vii) *Presentation*2

Total = 20

QUESTION B-1**MARKS**

(a) Plan (10)	
(i) Plan of structure.....	8
(ii) Correct orientation of plan	2
(b) Perspective drawing (31)	
(iii) Plan of spectator, PP, VP ₁ and VP ₂	4
(iv) Elevation of GL, HL, VP ₁ and VP ₂	8
(v) Sight lines from spectator to plan(3x2).....	6
(vi) Perspective of bottom edges	6
(vii) Establish height for front of shelter.....	2
(viii) Establish height for rear of shelter	2
(ix) Completion of drawing.....	3
(x) Presentation	4

Total = 45

QUESTION B-2

MARKS

(a) Interpenetration (33)

- (i) Plan of square prism3
- (ii) Elevation of square prism3
- (iii) Outline elevation of tunnel3
- (iv) Plan of tunnel.....3

Left Hand Side (LHS)

- (v) Projections from LHS of plan2
- (vi) Locate points on LHS of elevation4
- (vii) Complete LHS of elevation3

Right Hand Side (RHS)

- (viii) Projections from RHS of plan3
- (ix) Locate points on RHS of elevation5
- (x) Complete RHS of elevation3
- (xi) Hidden Detail1

(b) End View (8)

- (xii) Transfer of widths from plan.....2
- (xiii) Projection of heights from elevation2
- (xiv) End view of square prism2
- (xv) End view of tunnel2
- (xvi) ***Presentation***4

Total = 45

QUESTION B-3

(a) Plan and elevation (25)

- (i) Outline of elevation 8
- (ii) Complete the elevation 7
- (iii) Outline of plan..... 6
- (iv) Complete the plan..... 4

(b) Auxiliary elevation (16)

- (v) X_1Y_1 parallel to plan of surface A 1
- (vi) Projections from plan 1
- (vii) Transfer heights from elevation 2
- (viii) Draw surface A 3
- (ix) Complete auxiliary elevation 9

- (x) **Presentation** 4

Total = 45

QUESTION C-1

MARKS

- (a) Profile (21)**
- (i) Measure heights and draw horizontal lines6
 - (ii) Projections from intersections between line AB and contours7
 - (iii) Draw outline of profile8
- (b) Water level (6)**
- (iv) Identify lowest point of valley2
 - (v) Identify 8m water level2
 - (vi) Draw horizontal line on profile2
- (c) Earthworks for roadway (14)**
- (vii) Parallel lines at 5m intervals5
 - (viii) Identify points on earthworks curve4
 - (ix) Draw earthworks curve5
 - (x) *Presentation*4

Total = 45

QUESTION C-2

MARKS

(a) Elevation and Plan (23)

(i) Outline of surface ABCD in elevation	5
(ii) Elements in elevation (incl. division)	7
(iii) Outline of surface ABCD in plan	4
(iv) Elements in plan (incl. division or proj.)	5
(v) Curve in plan	2

(b) End view of Hyperbolic Paraboloid (18)

(vi) Determine heights and widths for surface ABCD	4
(vii) Draw the outline of the hyperbolic paraboloid	6
(viii) Draw the elements	6
(ix) Curve in end view	2
(x) <i>Presentation</i>	4

Total = 45

QUESTION C-3

MARKS

(a) Plan and Elevation (18)

- (i) Draw elevation6
- (ii) Outline plan6
- (iii) Complete the plan.....6

(b) Surface development (23)

- (iv) Development top surface6
- (v) Division of circumference2
- (vi) Development of curved surface.....3
- (vii) Development of vertical surface2
- (viii) Development of under surface2
- (ix) Development of front and back surfaces6
- (x) Width and length for triangular surfaces1
- (xi) Development of triangular surfaces1

- (xii) *Presentation*4

Total = 45

QUESTION C-4**MARKS****(a) Link Mechanism (19)**

(i)	Set up line diagram (O, A, B & C).....	8
(ii)	Draw circle about O	3
(iii)	Division of circle	2
(iv)	Arm AC in rotated positions	2
(v)	Points on locus	2
(vi)	Draw locus	2

(b) Displacement Diagram (22)

(vii)	360° division (widths on displacement diag.)	6
(viii)	Establish follower position at 0°, 150°, 180° and 360°	4
(ix)	0° to 150°, Uniform Velocity	3
(x)	150° to 180°, Dwell	3
(xi)	180° to 360°, Uniform Acceleration and Retardation	3
(xii)	Complete Displacement Diagram	3
(xiii)	Presentation	4

Total = 45

QUESTION C-5**MARKS*****Assembly (8)***

(i) Relative positioning of components 8

Door Plate (11)

(ii) Outline 7

(iii) Holes 2

(iv) Completion 2

Spacers (4)

(v) Correct diameter (height) 2

(vi) Correct width (6mm from table) 2

Swing Arm (8)

(vii) Outline 6

(viii) Completion 2

Bolt, Nut and Washer (6)

(ix) Head (incl. curves) 2

(x) Shaft (incl. threads) 2

(xi) Nut and washer (incl. curves) 2

Drawing Completion (4)

(xii) Hidden detail and Centrelines ... (2,2) 4

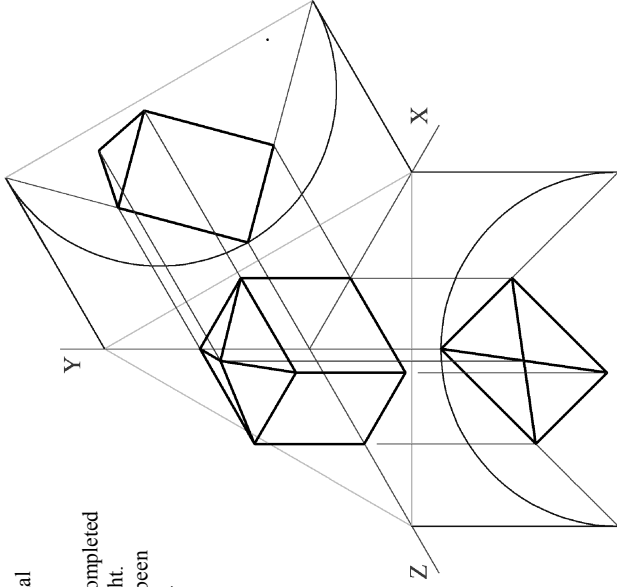
(xiii) ***Presentation*** 4

Total = 45

SECTION A - Core - Answer Any Three of the questions on this A3 sheet

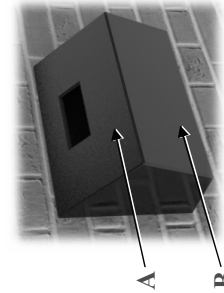
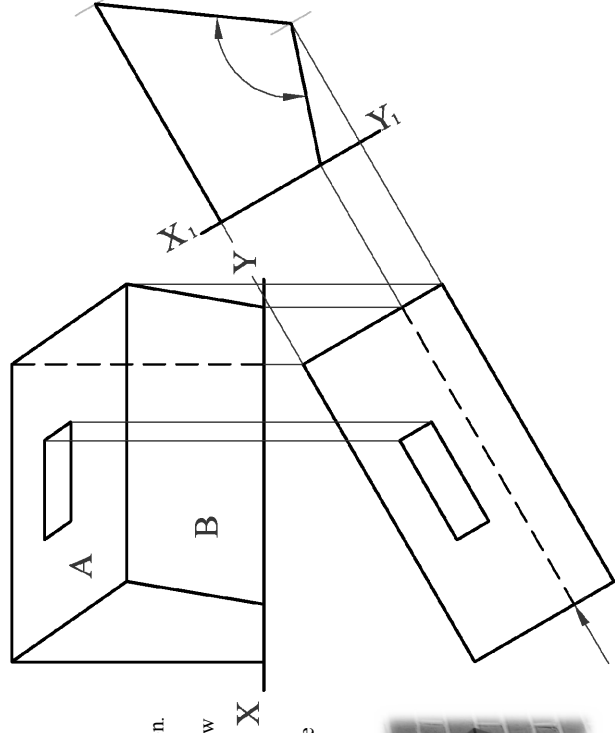
A-1. The 3D graphic below shows a traditional Irish telephone box.

A set of isometric axes and a partially completed drawing of the box are shown on the right. The elevation and plan of the box have been positioned relative to the axes as shown. Complete the axonometric projection.



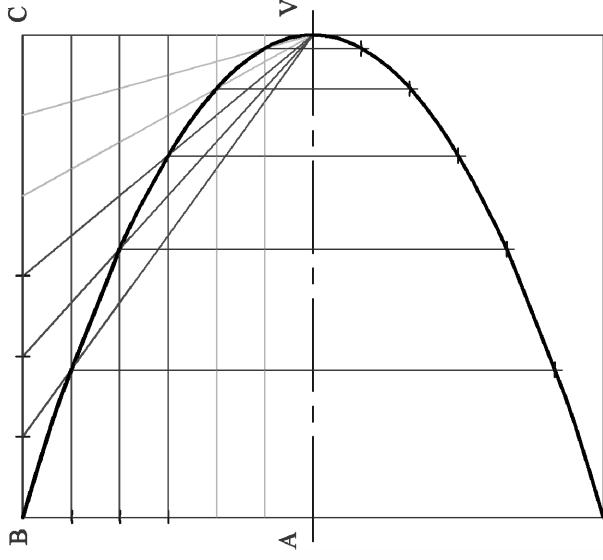
A-2. The 3D graphic below shows a post box. The plan and incomplete elevation of the box are shown on the right.

- (a) Complete the elevation.
- (b) Draw an auxiliary view of the post box, on the given X_1Y_1 , which will show the true angle between the surfaces **A** and **B**.



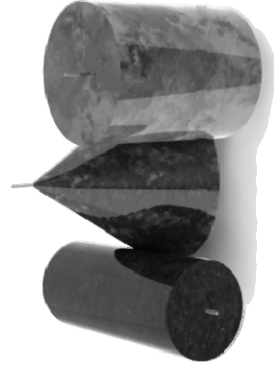
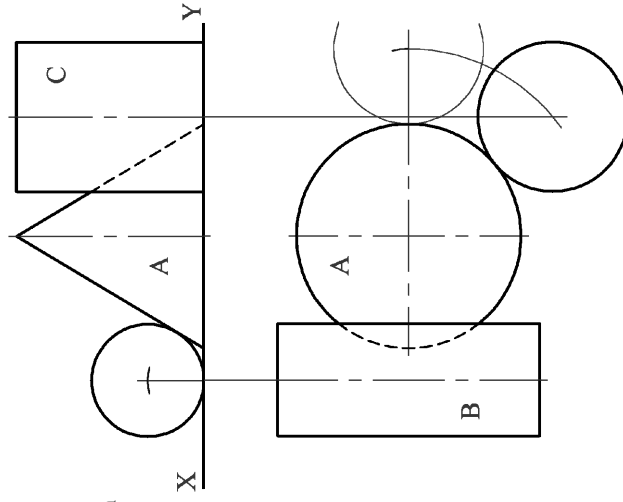
A-3. The 3D graphic below shows Dublin's newest bridge, which is in the shape of a semi-parabola.

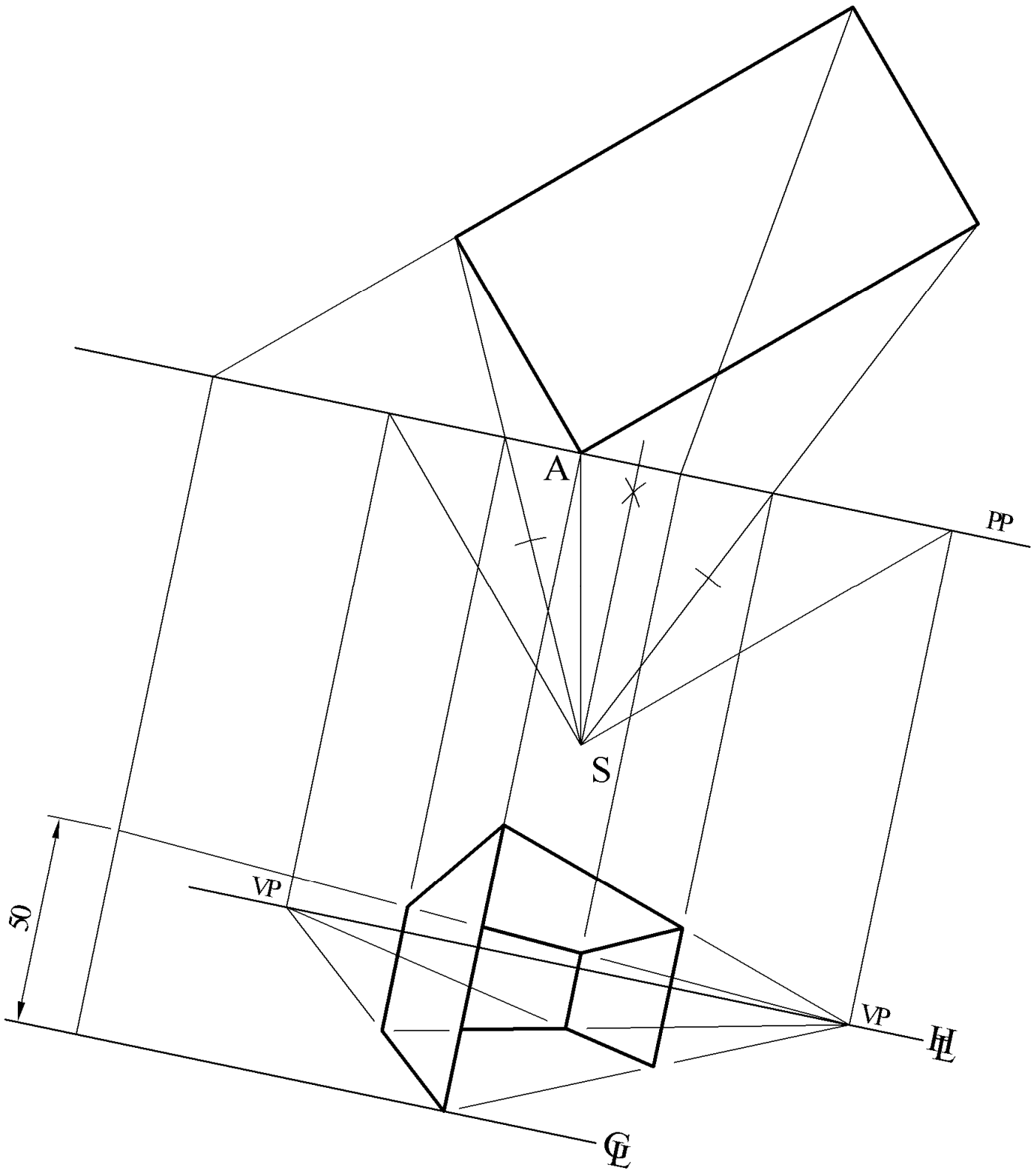
- The drawing on the right shows a rectangle ABCV with a portion of the parabola inscribed.
- (a) Locate the remaining points on the curve and complete the semi-parabola.
 - (b) Draw the lower half of the parabola, representing the reflection in the water, as shown below.



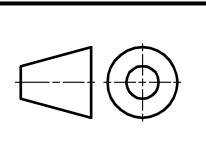
A-4. The 3D graphic below shows three candles which are in contact. The arrangement includes a cone and two cylinders. All three solids rest on the horizontal plane. The drawing on the right shows the plan and elevation of the cone **A**. Cylinder **B** is shown in the plan and cylinder **C** is shown in the elevation.

- (a) Draw the elevation of cylinder **B**.
- (b) Draw the plan of cylinder **C**.





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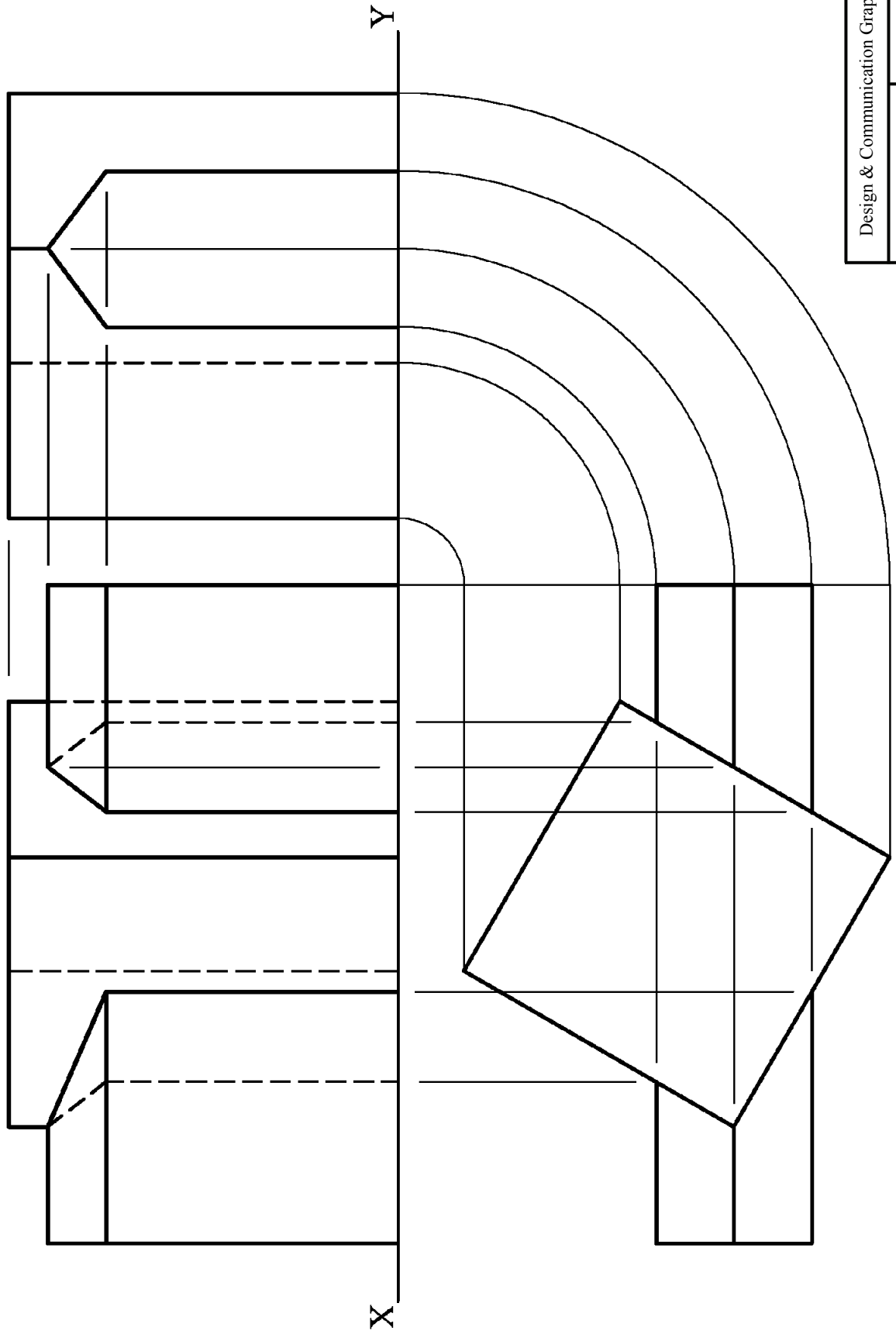


Marking Scheme

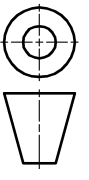
Question B-1

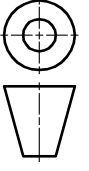
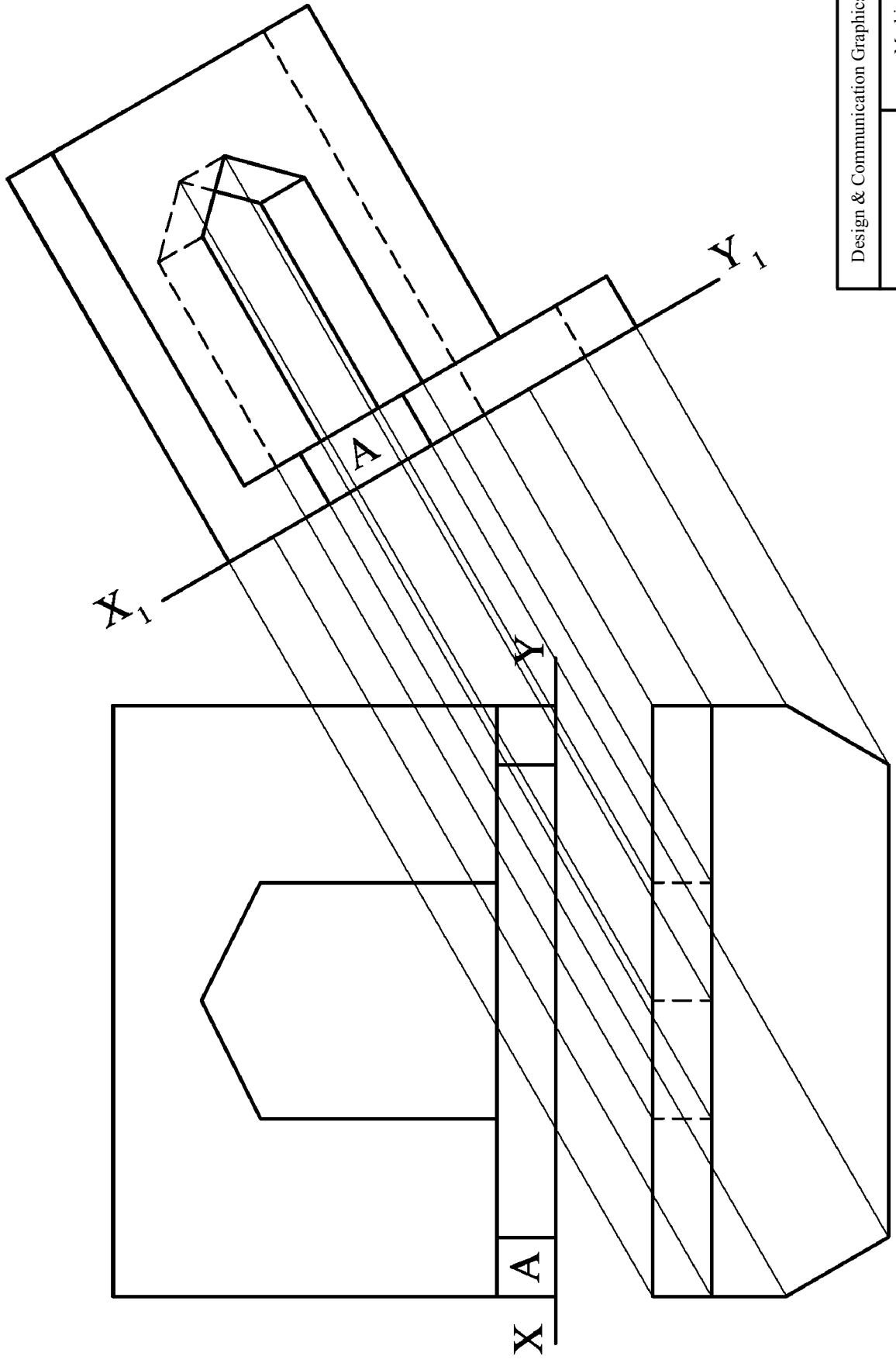
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June 2011



Design & Communication Graphics – Ord. Level	
Marking Scheme	
Question B-2	
Scale: n/a	June 2011



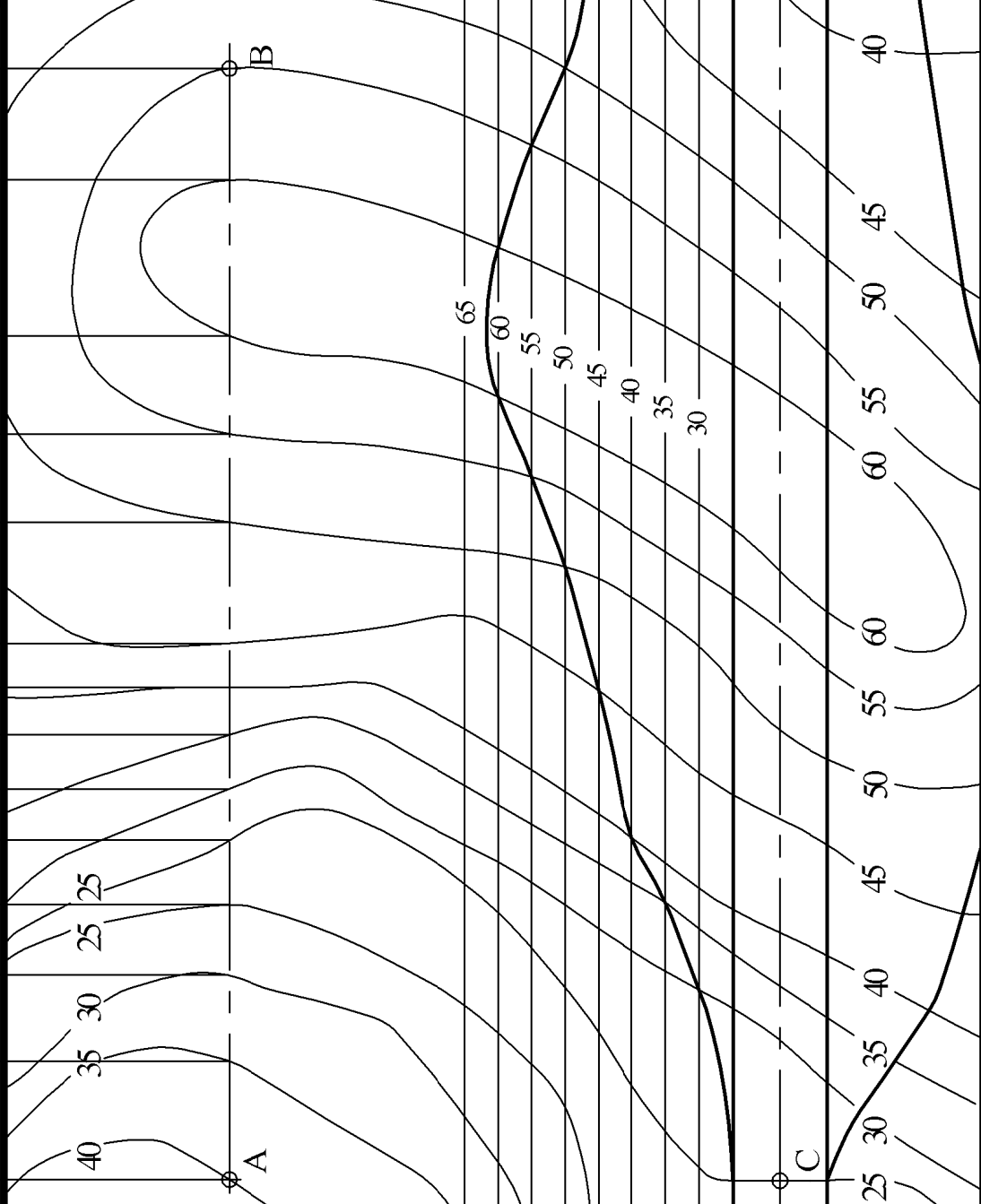
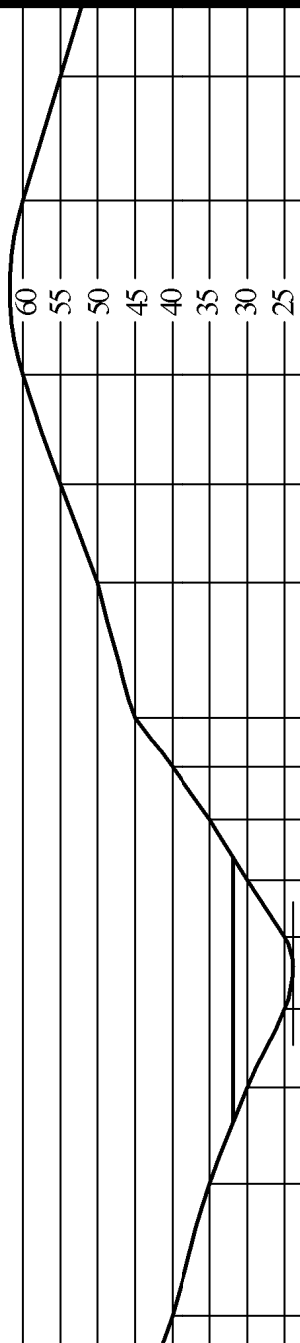
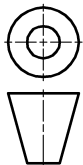


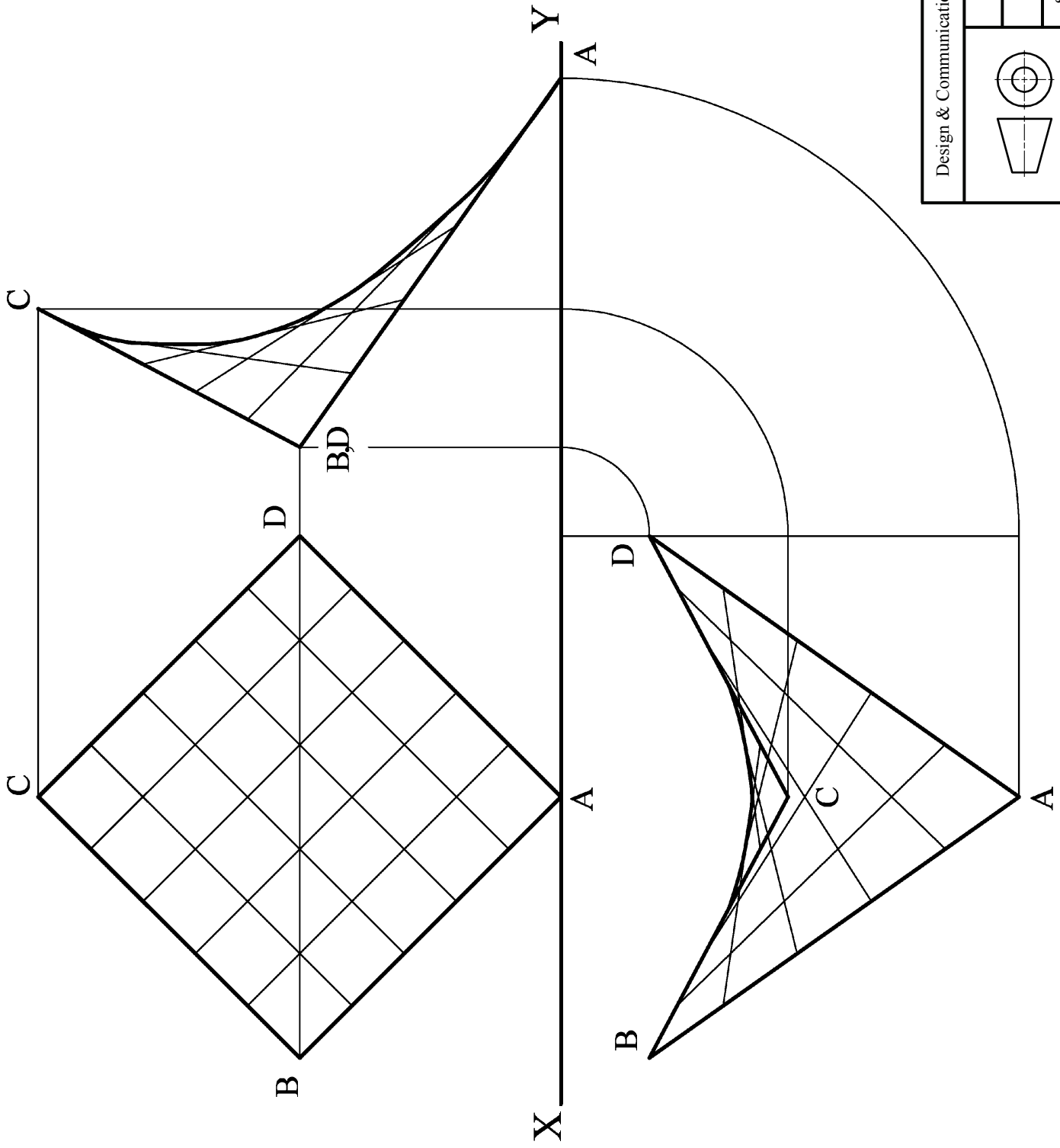
Design & Communication Graphics – Ord. Level

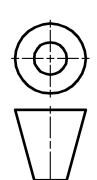
Marking Scheme

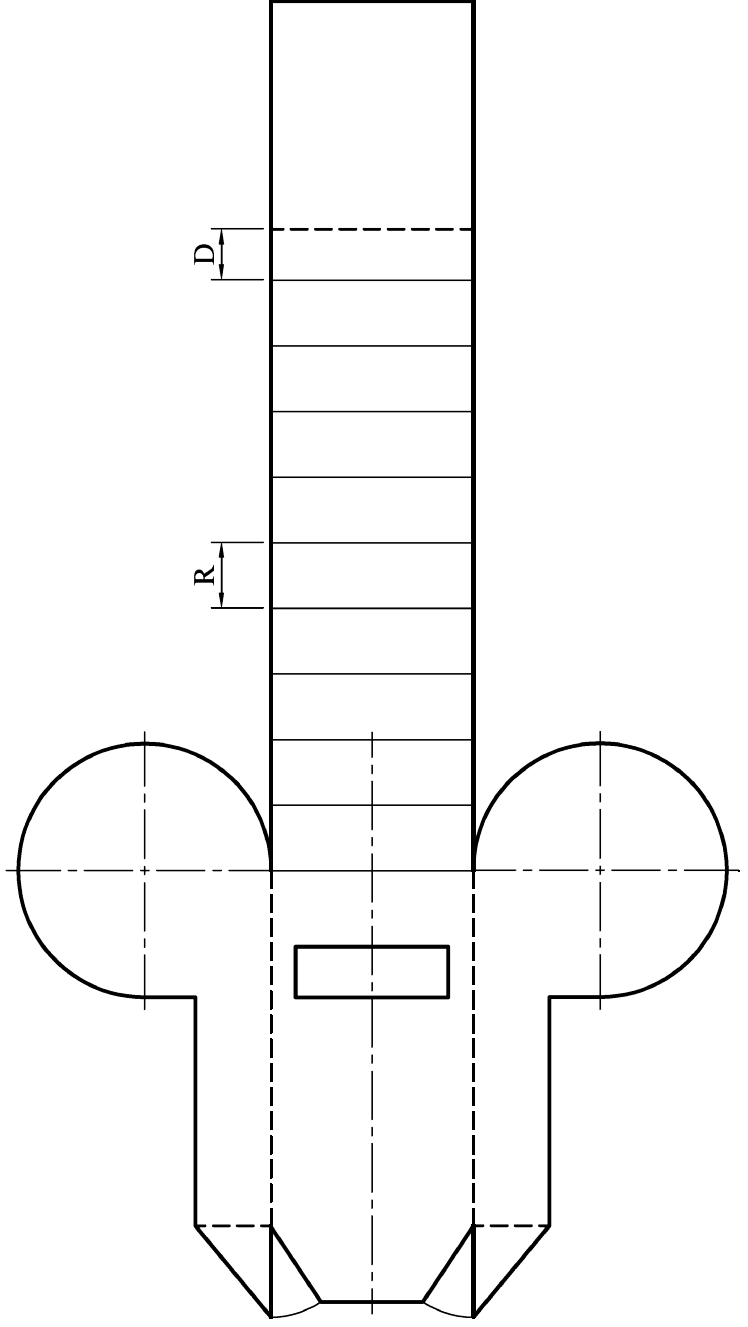
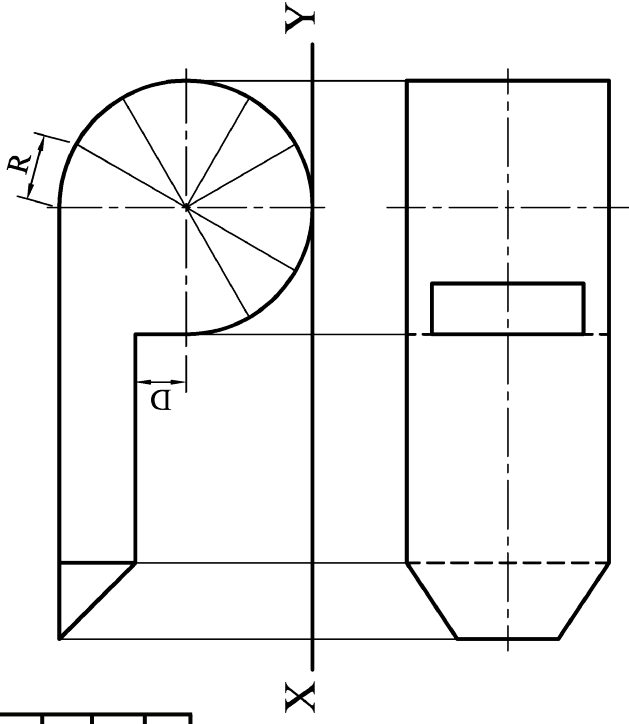
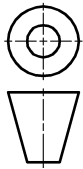
Question C-1

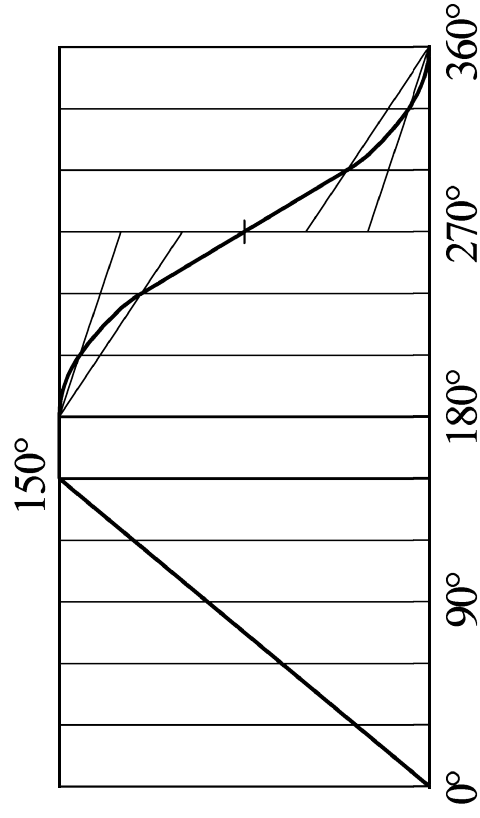
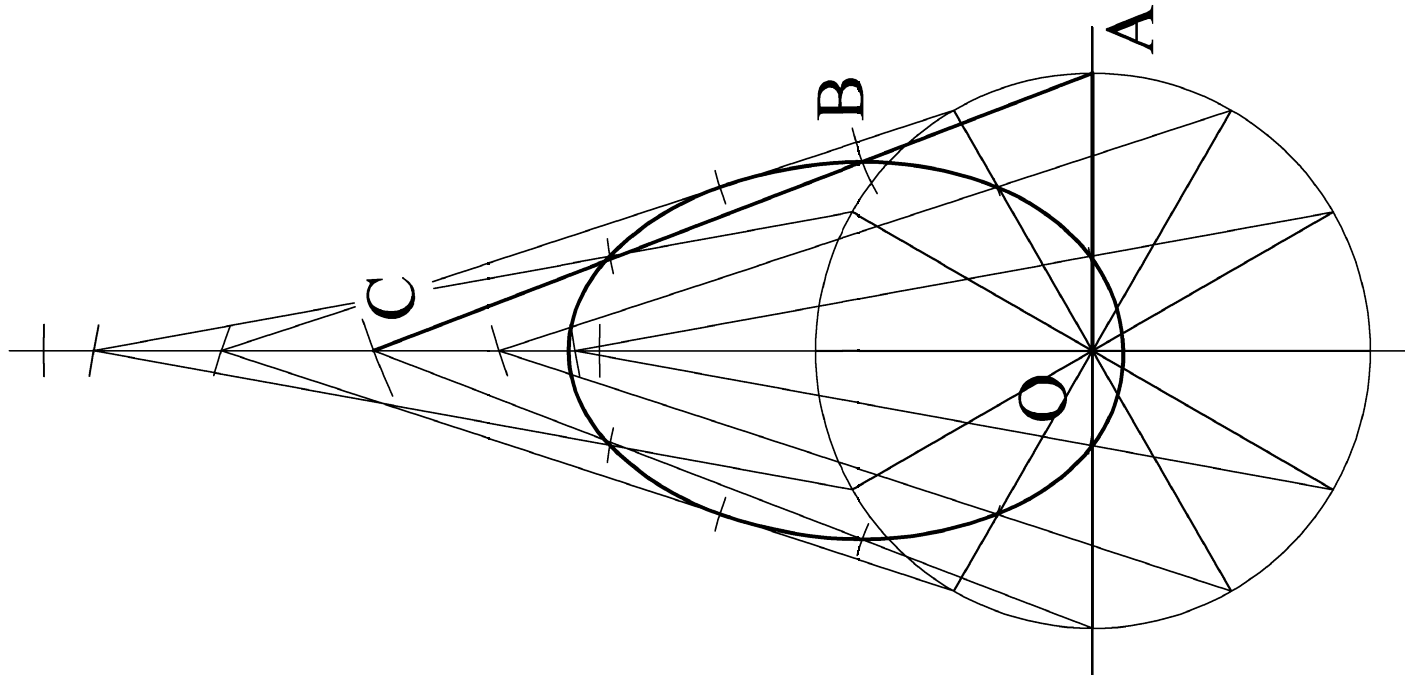
Scale: n/a June 2011





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Marking Scheme	
Question C-2	
Scale: n/a	June 2011





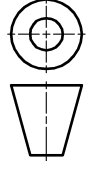
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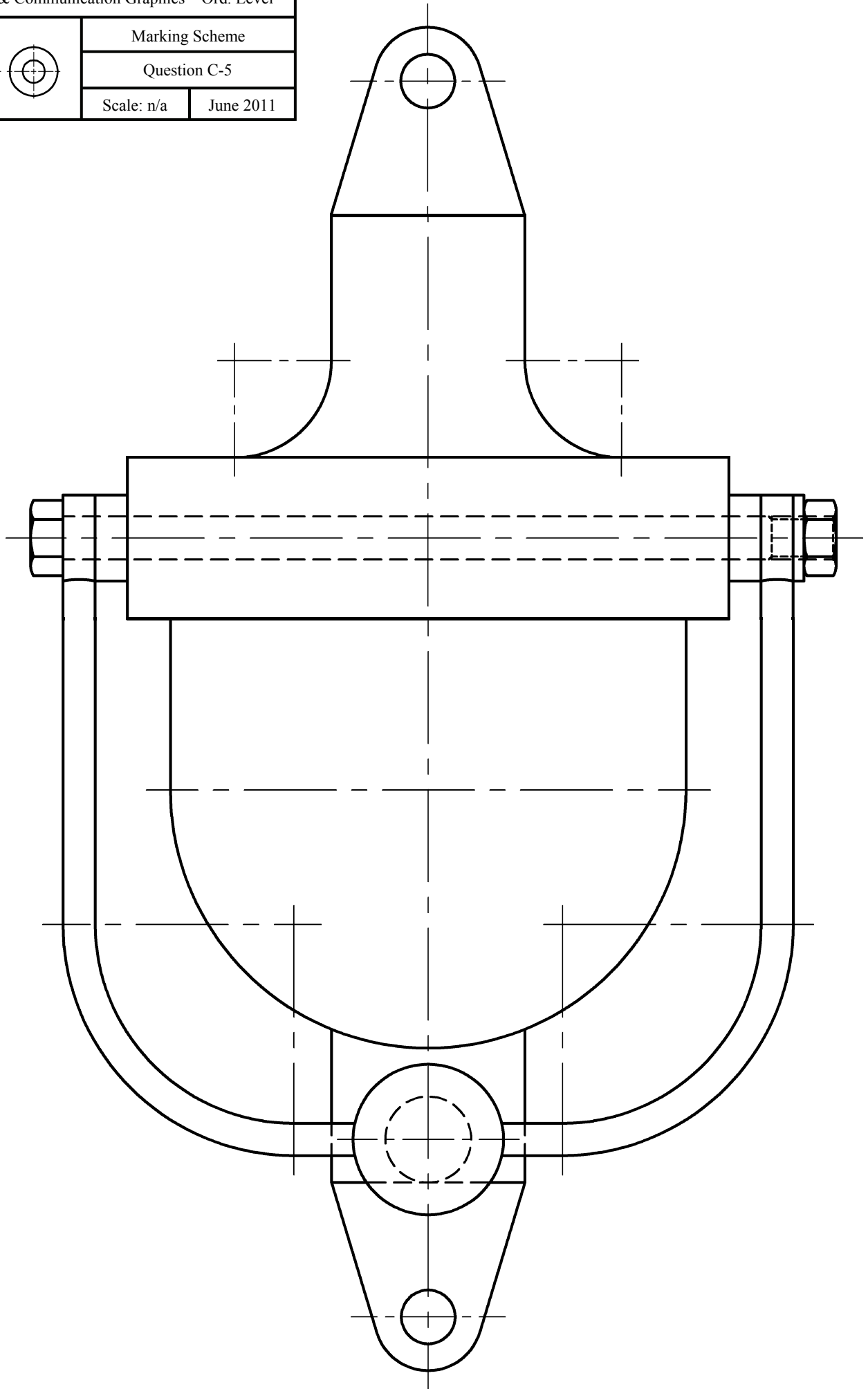
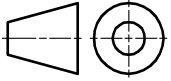
Marking Scheme

Question C-4

Scale: n/a

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Design and Communication Graphics

Student Assignment - Ordinary Level

Assessment Sheet

Candidate Exam No.

Output	Marking criteria	Marks
1	Design Research - Exploration of main design features using primary & secondary research; Selection of appropriate graphics; Effective layout and presentation of information combining images, sketches & annotations	
	a) Extensive range of relevant criteria considered - excellent presentation	13 - 15
	b) Most relevant criteria considered - very good presentation	10 - 12
	c) Some relevant criteria considered - good presentation	7 - 9
	d) Limited criteria considered - fair presentation	4 - 6
	e) At least one criterion considered - poor presentation	0 - 3
2	Design Feature Comparison - Selection of two appropriate images; Main dimensions inserted; Comparison of main design features; Contrasting of main design features; Effective layout and presentation of information combining images, sketches & annotations	
	a) Extensive range of relevant criteria considered - excellent presentation	13 - 15
	b) Most relevant criteria considered - very good presentation	10 - 12
	c) Some relevant criteria considered - good presentation	7 - 9
	d) Limited criteria considered - fair presentation	4 - 6
	e) At least one criterion considered - poor presentation	0 - 3
3	Freehand Graphical Representation – Proportion; Form/Volume; Use of Tone/Line for effective rendering; Detailed communication of main design features to include 3D presentation quality drawing; Layout & presentation	
	a) Extensive range of relevant criteria considered - excellent presentation	17 - 20
	b) Most relevant criteria considered - very good presentation	13 - 16
	c) Some relevant criteria considered - good presentation	9 - 12
	d) Limited criteria considered - fair presentation	5 - 8
	e) At least one criterion considered - poor presentation	0 - 4
4	SolidWorks Parts, Assembly, Drawing and eDrawing files	
	• Adherence to required filing structure	3
	• Creation of a minimum of 3 Part files	6
	• Part models - Proficiency in Parametric CAD; Selection of most appropriate profile; Sketches fully defined; Features renamed; Appropriate type of extrusions used	12
	• Assembly – Creation of Assembly environment; Accuracy of parts to facilitate correct assembly; Correct mating of parts; Application of appropriate appearances	6
	• Factor of difficulty	3
	• eDrawing of CAD model	3
5	Hardcopy outputs from SolidWorks - Detailed orthographic views of the Assembly; Rendered pictorial view of the Assembly; Exploded view of the CAD model; Inclusion of main dimensions; Scaling, layout and presentation	
	a) Extensive range of relevant criteria considered - excellent presentation	17 - 20
	b) Most relevant criteria considered - very good presentation	13 - 16
	c) Some relevant criteria considered - good presentation	9 - 12
	d) Limited criteria considered - fair presentation	5 - 8
	e) At least one criterion considered - poor presentation	0 - 4
6	Photorealistic Representation	
	Produce photorealistic computer generated images of the artefact	7
7	Graphical exploration of design solutions - Exploration of theme/possible solution(s); Justification of chosen solution(s); Use of appropriate images/graphics; Effective layout and presentation of information combining images, sketches & annotations	
	a) Extensive range of relevant criteria considered - excellent presentation	17 - 20
	b) Most relevant criteria considered - very good presentation	13 - 16
	c) Some relevant criteria considered - good presentation	9 - 12
	d) Limited criteria considered - fair presentation	5 - 8
	e) At least one criterion considered - poor presentation	0 - 4
8	Presentation of Modification/Concept Design – Proportion, Form/Volume, Use of Tone/Line for effective rendering, Detailed communication of modified/concept design features; Layout and presentation	
	a) Extensive range of relevant criteria considered - excellent presentation	9 - 10
	b) Most relevant criteria considered - very good presentation	7 - 8
	c) Some relevant criteria considered - good presentation	5 - 6
	d) Limited criteria considered - fair presentation	3 - 4
	e) At least one criterion considered - poor presentation	0 - 2
9	Hardcopy outputs from SolidWorks - CAD model; Detailed orthographic views of the proposed solution; Rendered pictorial view of the CAD model, Inclusion of main dimensions; Scaling, layout and presentation	
	• Application of CAD skills	5
	a) Extensive range of relevant criteria considered - excellent presentation	13 - 15
	b) Most relevant criteria considered - very good presentation	10 - 12
	c) Some relevant criteria considered - good presentation	7 - 9
	d) Limited criteria considered - fair presentation	4 - 6
	e) At least one criterion considered - poor presentation	0 - 3
Sub-total		
	Marks deducted for pages in excess of maximum	
		Total

