



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE 2010

MARKING SCHEME

TECHNICAL GRAPHICS

HIGHER LEVEL

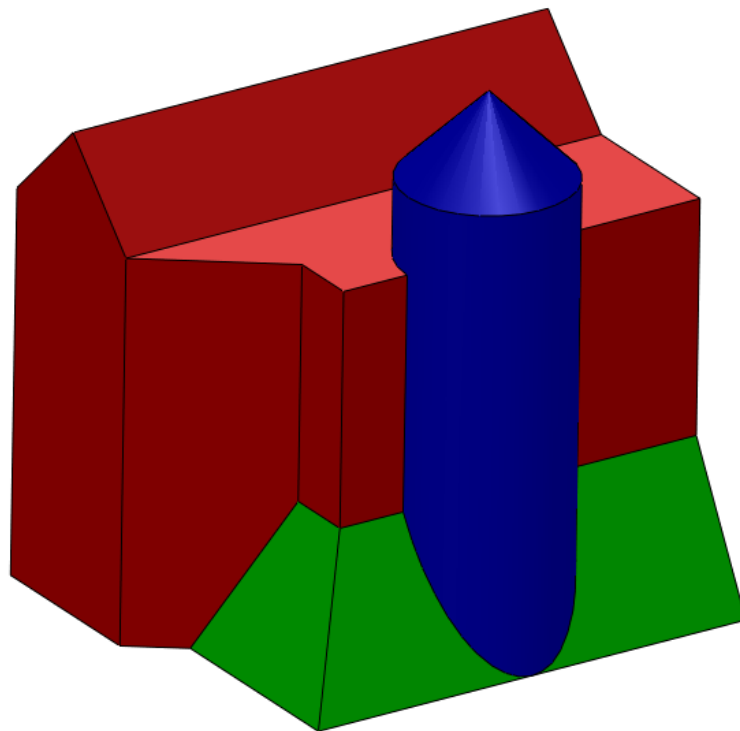
Sections A and B



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Junior Certificate Examination 2010

Technical Graphics



Higher Level
Marking Scheme

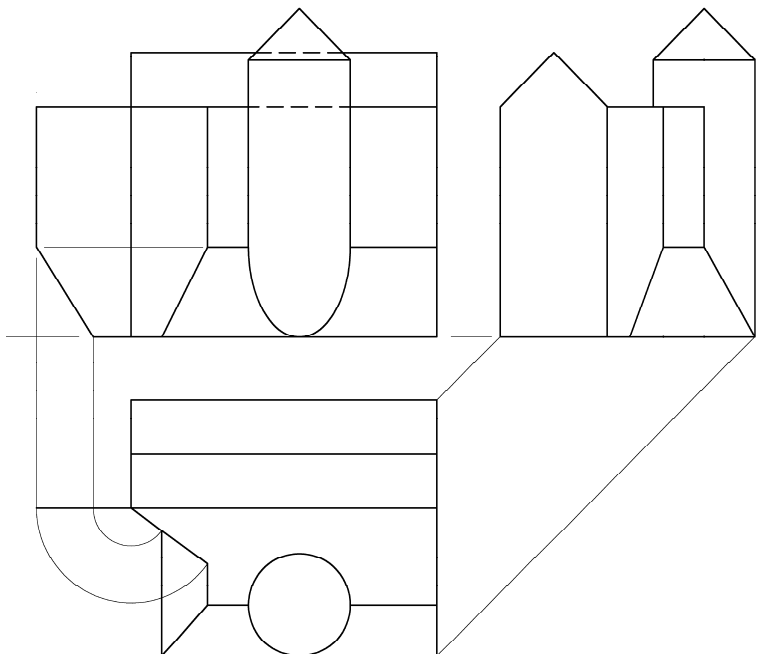
Section A and B

Section A – any ten questions from this section

Q1	12	Four labels, 3 marks for each correct label.		
Q2	12	2 marks per line		
Q3	5	Step out lengths of sides		
	3	Projection of lengths		
	4	Complete development		
Q4	6	Top of writing desk – three faces		
	4	Complete desk legs		
	2	Shade or Colour		
Q5	2	Parallel line from B₁	4	Establish ratio AB to AB₁
	4	Radiating lines from A(2+2)	2	Find required lengths
	4	Complete Logo	4	Complete Logo
	2	Shade or colour	2	Shade or colour
Q6	12	4 marks for each correct coordinate		
Q7	12	Six points of contact, 2 marks each		
Q8	8	3 marks base, 2 marks stem, 3 marks top		
	4	Appropriate shading or colour		
Q9	12	Trim, Chamfer and Circle (4 marks for each correct term)		
Q10	3	Projection lines from elevation to plan		
	2	Rotate lines in plan		
	4	Project required for new elevation (2,2)		
	3	Complete new elevation		
Q11	6	A = 72°		
	6	B = 80°		
Q12	4	Projections to plan		
	8	Complete truncation		
Q13	4	Project perpendicular to X ₁ Y ₁		
	2	Heights		
	4	Complete bridge		
	2	Hidden detail		
Q14	6	Step 2 parallel lines (3,3)	Bisect angle(3) parallel line (3)	
	2	Identify centre and draw wheel		
	4	Locate points of contact		
Q15	9	Three sectors – 3 marks each		
	3	Shade or colour		

Section B – any four questions from this section

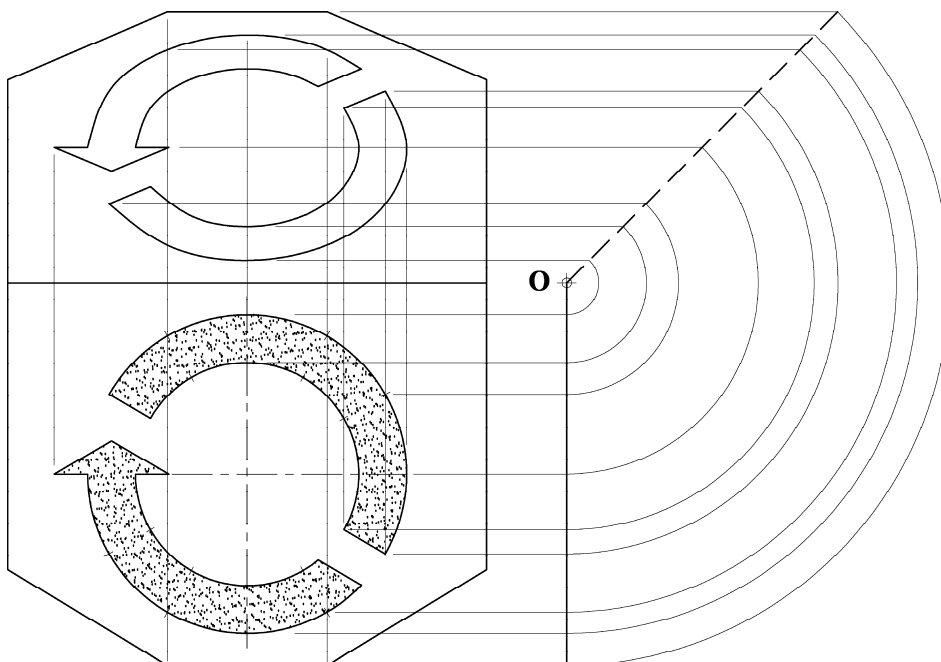
Q.1 – Orthographic Projection.



Elevation (22)		
7	Straight lines	
5	Tower – Cylinder (2), Cone (3)	
6	Elliptical curve: Points in plan, project to EV, project to elev, Draw (1,1,2,2)	
2	Sloping line	
2	Hidden detail	
Plan (13)		
9	Straight lines	
2	Tower	
2	Sloping lines (1+1)	
End View (17)		
9	9 Straight lines on main structure	
3	Sloping lines (2+1)	
5	Tower	
True Shape (8)		
8	Rotate in plan	Project perpendicular
	Project from plan (4), project from elev (2), completion (2)	New xy lines (4), transfer heights (2), completion (2)
10	Drafting, accuracy, presentation	

Total Marks 70

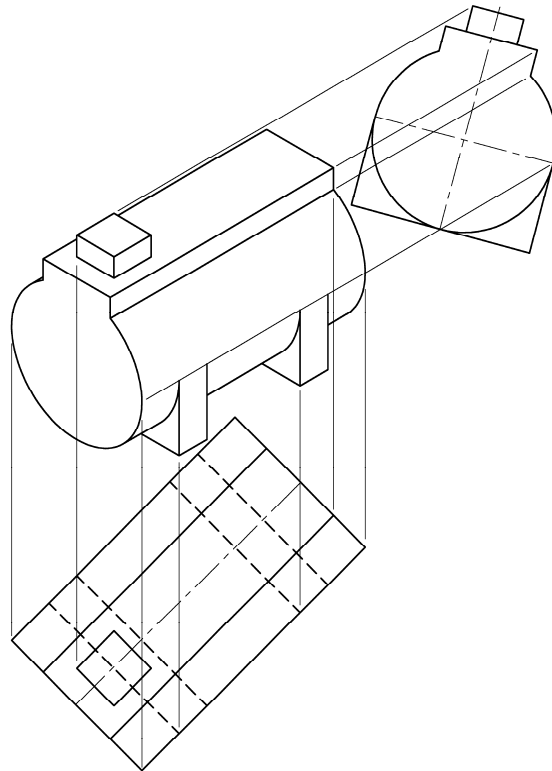
Q.2 - Orthographic, Rotation, Elevation.



Given Elevation (18)	
6	Draw outline
4	Circles (2+2)
5	Arrow head
3	Three 30 ⁰ lines
Given End View (6)	
2	Horizontal line
4	45° angle (2), correct length (2)
New Figure (36)	
3	Projection of straight lines of outline from elevation to end view
3	Rotation of points in end view
3	Projection from end view to new figure in elevation
3	Projection from elevation to new figure in elevation
5	Draw outline
10	Semi-elliptical curves – (5 marks each)
4	Complete arrow head in end view – 4 lines
5	Complete 30 ⁰ lines (2,2,1)
10	Drafting, accuracy, presentation

Total Marks 70

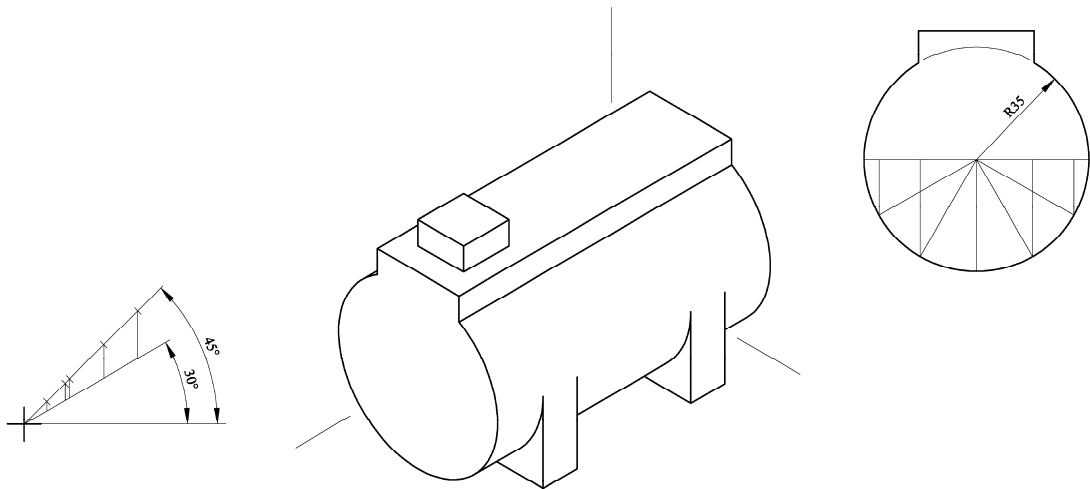
Q.3 (a) - Isometric Projection (Axonometric Axes Method)



Axonometric Axes Method	
Plan (14)	
6	Outline of tank body
4	Legs (4 lines)
4	Access hatch
Side Elevation (12)	
6	Tank body – Circle (3), Three lines (3)
3	Legs
3	Access hatch
Completion of Isometric Projection (34)	
5	Rectangular portion of tank body
12	Projection of circular front (9) and back (3) of tank
10	Legs – lines (6), curves (2+2)
7	Access hatch (3,2,2)
10	Drafting, accuracy, presentation

Total Marks 70

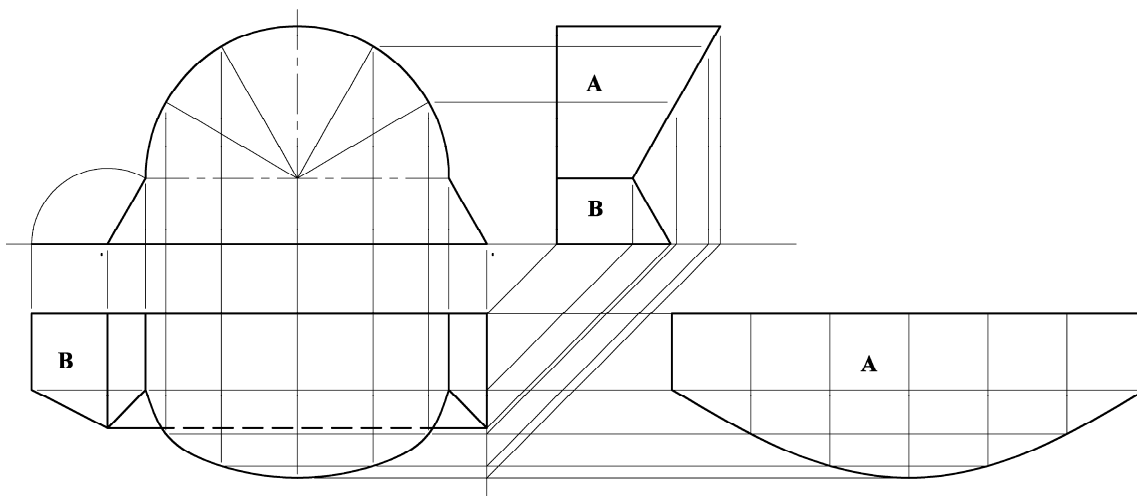
Q.3 (b) - Isometric Projection (Isometric Scale Method)



Isometric Scale Method	
Isometric Scale (8)	
4	Setting up isometric scale (2 marks for 30° line and 2 marks for 45° line)
2	Applying dimensions on 45° line
2	Projecting vertically from 45° line onto 30° line
Construction of tank (12)	
2	Apply scaled measurements required for tank
2	Determining height of tank top
8	Construction required for circle (3, 3, 2)
Isometric Projection (6)	
6	Direction of axes (2,2,2)
Completion of Isometric Projection (34)	
5	Rectangular portion of tank body
12	Projection of circular front (9) and back (3) of tank
10	Legs – lines (6), curves (2+2)
7	Access hatch (3,2,2)
10	Drafting, accuracy, presentation

Total Marks 70

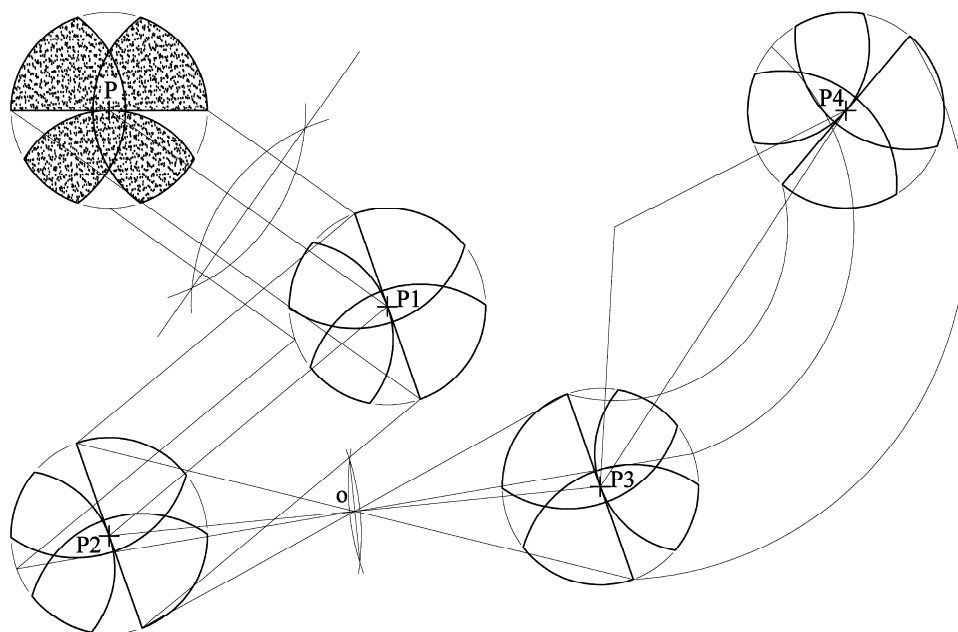
Q.4 - Development



Elevation (7)		
7	Circle (2), 3 lines (2,2,1)	
End-View (6)		
6	6 lines	
Plan (15)		
8	8 lines	
6	Elliptical curve: Points in elev, project to EV, project to plan, Draw (1,1,2,2)	
1	Hidden detail	
Development of surface A (20)		
6	Stepping out length of development curve (3 correct increment, 3 correct No)	
4	Projecting lengths	
4	Locating points	
6	Drawing the required development	
Development of surface B (12)		
12	Rotate in elevation	Project perpendicular
	Rotation (4), projection (4), completion (4)	New xy lines (4), transfer heights (4), completion (4)
10	Drafting, accuracy, presentation	

Total Marks 70

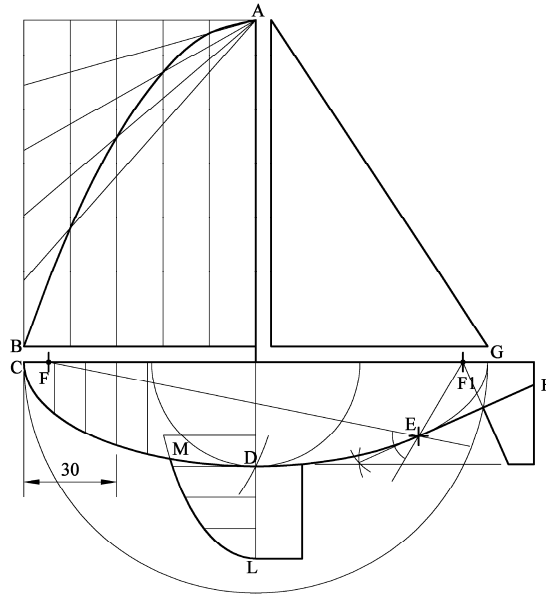
Q.5 - Transformation Geometry



Setting up (8)	
7	Drawing Arcs (2,2,2,1)
1	Line
Axial Symmetry (12)	
4	Projecting perpendicular to symmetry line. (Deduct 2 marks if not perp.)
4	Locating key image points
4	Drawing the image figure accurately
Translation (12)	
4	Lines projected parallel to P1 – P2 .
4	Locating key image points.
4	Drawing the image figure accurately.
Central Symmetry (12)	
4	Locate point O (2), project lines through O (2)
4	Locating key image points.
4	Drawing the image figure accurately
Rotation (16)	
4	Locating centre of rotation. (Joining P3 to P4 and applying 30° angles)
4	Drawing arcs
4	Locating key image points.
4	Drawing the image figure accurately
10	Drafting, accuracy, presentation

Total Marks 70

Q.6 - Ellipse and Parabola



Sails (15)	
3	Triangular sail
8	Construction to determine points on the parabola (2,2,2,2)
4	Drawing of parabolic sail
Ellipse (22)	
4	Draw major circle
8	Locating minor axis: swing major from F or F₁ (4) and draw (4) minor circle
6	Locating additional points on the curve (2, 2, 2)
4	Drawing the curve
Curve LM (10)	
2	Draw ordinate 30 mm from vertex
4	Identify vertical and horizontal distances for three points (2,2)
2	Draw the curve LM
2	Complete keel
Tangent (8)	
2	Locate point E
2	Joining F and F₁ through pt E
2	Bisect angle between EF and EF₁
2	Draw tangent
Completion (5)	
5	90° line (2), three lines(1)
10	Drafting, accuracy, presentation

Total Marks 70