



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2012

Marking Scheme

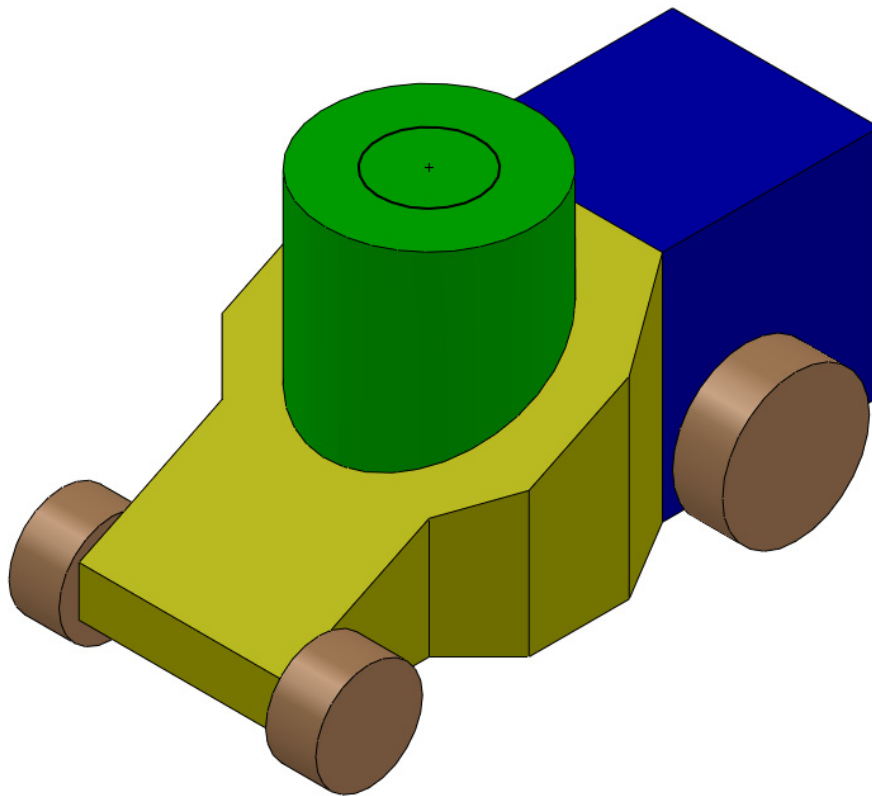
Technical Graphics

Higher Level



Junior Certificate Examination 2012

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Marking Scheme

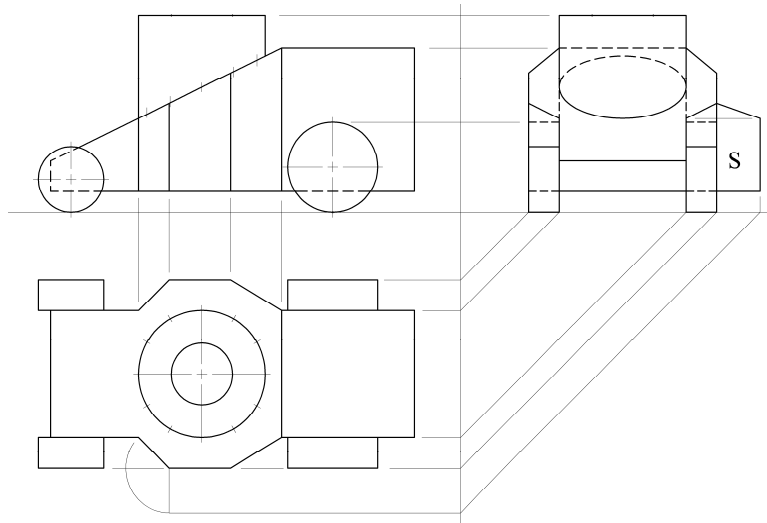
Section A and B

Section B – any four questions from this section

Q1	12	Four diagrams, 3 marks for each correct label.
Q2	6	Construction arcs: Rad 35mm(2), Step 35mm(2), Arc (2)
	2	Locate point of contact
	4	Draw Arc BC
Q3	2	Locate back apex
	10	Five lines, 2 marks each
Q4	5	Top of bench
	5	Complete legs: Front (3), back (2)
	2	Colour or Shade
Q5	12	Develop four faces, 3 marks each.
Q6	8	Line (2), six equal divisions (3), parallel lines (3)
	4	Applying parallel lines to sign
Q7	4	Projections to plan
	8	Complete the cut in plan
Q8	8	Kicking tee depicted in a <u>good quality</u> freehand pictorial
	4	Appropriate shading or colour
Q9	12	Offset, Mirror, Extrude Boss/Base, Circle (4 marks for each correct term; any three terms)
Q10	4	Extend arm (2) and locate length (2)
	5	Rotate points
	3	Complete sign
Q11	4	A = 116°
	4	B = 45°
	4	C = 45°
Q12	2	Drawing FP & F1P
	4	Determine half major axis: length (2), bisect (2)
	3	Locate points A, B and C
	3	Triangle ABC
Q13	3	Bisect base of triangle
	3	Draw semi-circle
	2	Project apex
	4	Completion windscreen
Q14	3	Project perpendicular to X₁Y₁
	2	Heights
	4	Complete axe head
	3	Hidden detail
Q15	8	Four points, 2 marks each
	4	Complete line

Section B – any four questions from this section

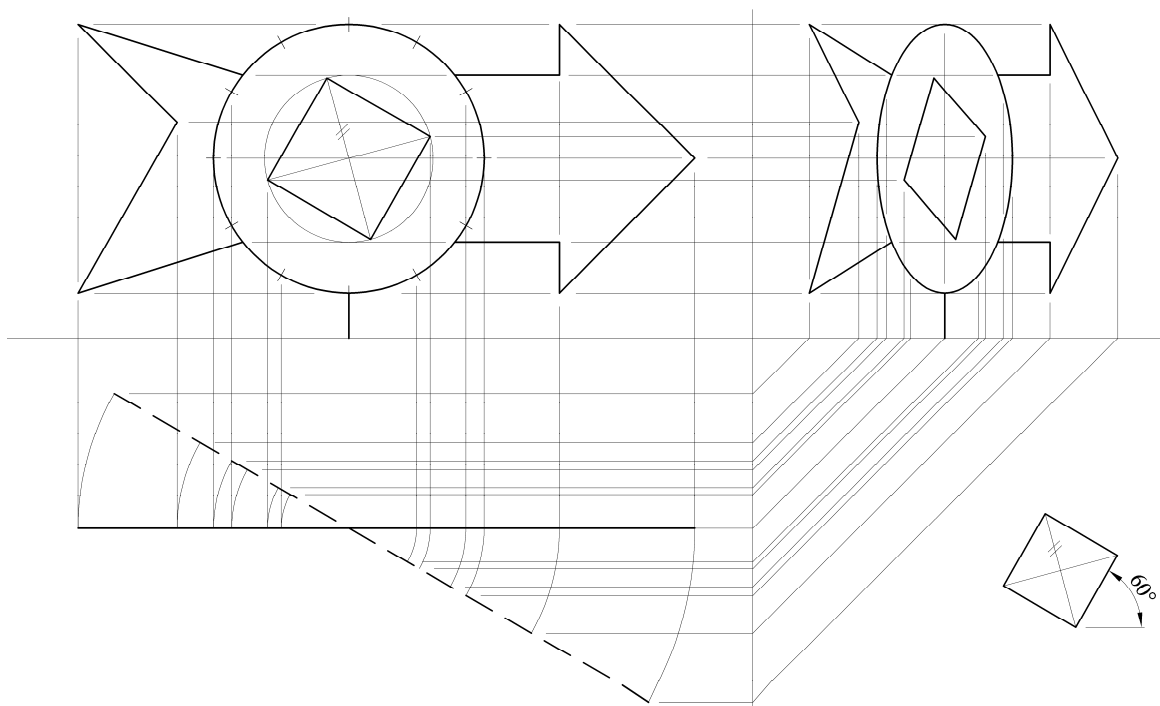
Q.1 – Orthographic projection.



Elevation (15)		
5	Outline	
4	Vertical lines for side of lawnmower	
2	Wheels: Two circles (1,1)	
2	Three lines for cylindrical motor	
2	Hidden detail	
Plan (16)		
6	Outline	
8	Lines for front and back wheels (2,2,2,2)	
2	Circles	
End View (21)		
2	Front rectangle	
4	Front wheels	
4	Inclined lines	
6	Elliptical curve: Points in plan, project to elev, project to EV. Draw (1,1,2,2)	
2	Cylindrical motor	
3	Hidden detail	
True Shape (8)		
	Rotate in plan	Project perpendicular
	Project from plan (3), project height (2), completion (3)	New xy line (3), transfer heights (2), completion (3)
10	Drafting, accuracy, presentation	

Total Marks 70

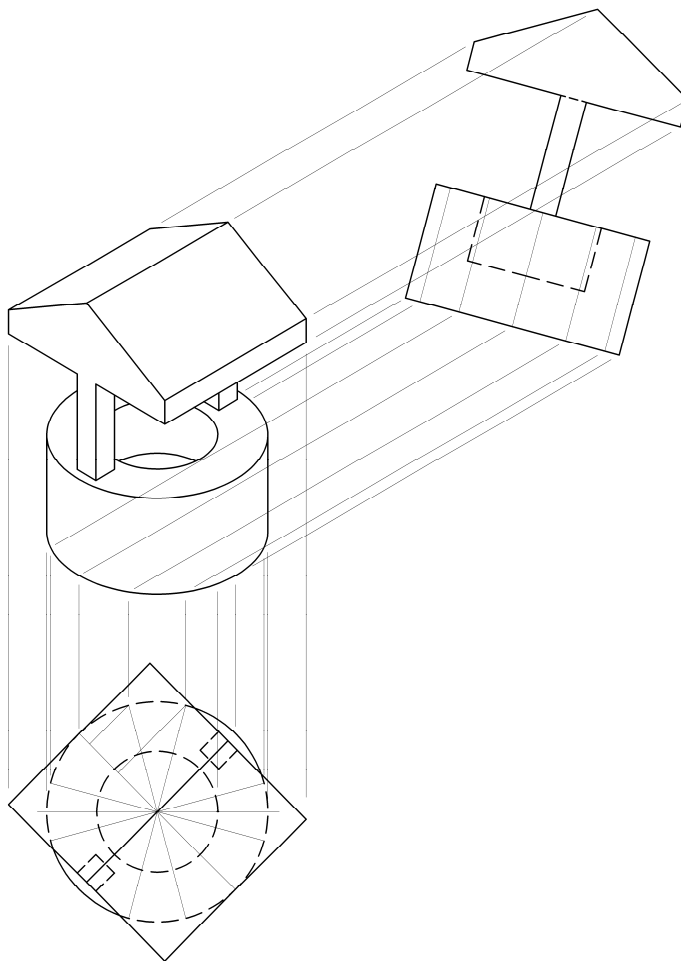
Q.2 - Orthographic, Rotation, End View.



Given Elevation (18)	
3	Radius 45mm circle (2), vane support (1)
4	Arrowhead
4	Arrow tail
7	Square: Circle (2), Determine inclination (2), Drawing square (3)
Given Plan (6)	
2	Horizontal line
4	30° Line (2), correct length (2)
New Figure (36)	
3	Projection of points to plan
3	Rotation of points in plan
3	Projections from elevation to new figure in end view
3	Projections from plan to new figure in end elevation view
12	Ellipse
4	Arrowhead
4	Arrow tail
4	Square
10	Drafting, accuracy, presentation

Total Marks 70

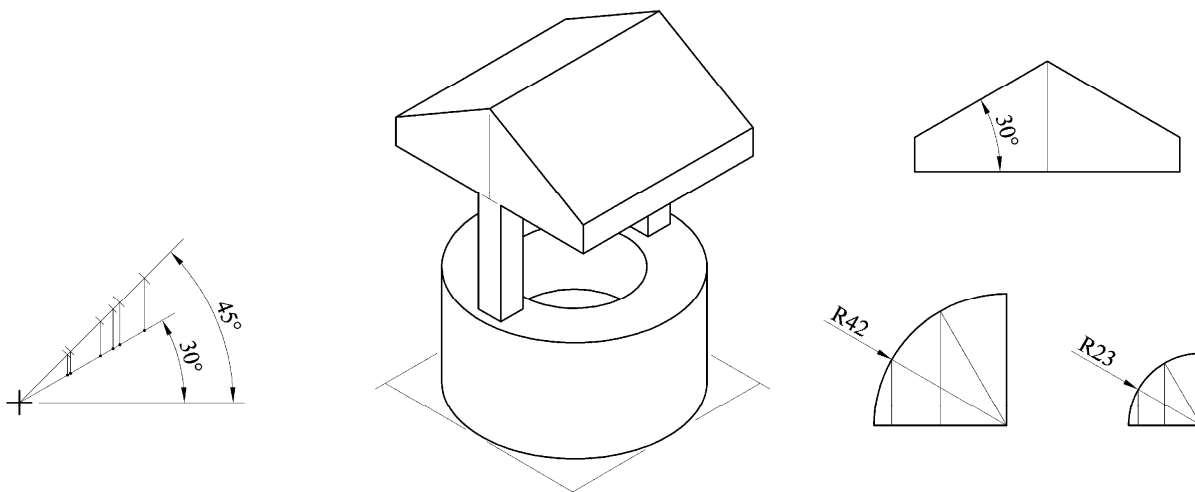
Q.3 (a) - Isometric Projection (Axonometric Axes Method)



Axonometric Axes Method	
Plan (13)	
4	Circles
5	Roof
4	Stands
Elevation (13)	
4	Base (2), hole (2)
2	Stands
7	Roof
Completion of Isometric Projection (34)	
12	Cylindrical base (5,5,2)
8	Stands
8	Roof
6	Cylindrical hole (4,2)
10	Drafting, accuracy, presentation

Total Marks 70

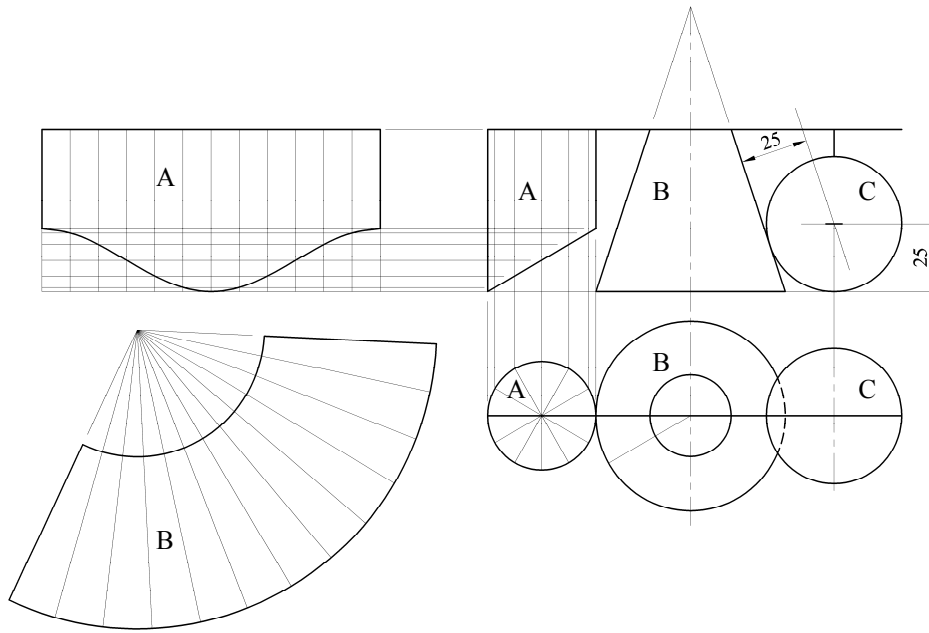
Q.3 (b) - Isometric Projection (Isometric Scale Method)



Isometric Scale Method	
Isometric Scale (11)	
4	Setting up isometric scale (2 marks for 30° line and 2 marks for 45° line)
4	Applying dimensions on 45° line
3	Projecting from 45° line onto 30° line
Construction of ornamental well (12)	
3	Apply scaling required for ornamental well
9	Construction required for arcs and roof (3,3,3)
Isometric Projection (3)	
3	Direction of axes (1,1,1)
Completion of Isometric Projection (34)	
12	Cylindrical base (5,5,2)
8	Stands
8	Roof
6	Cylindrical hole (4,2)
10	Drafting, accuracy, presentation

Total Marks 70

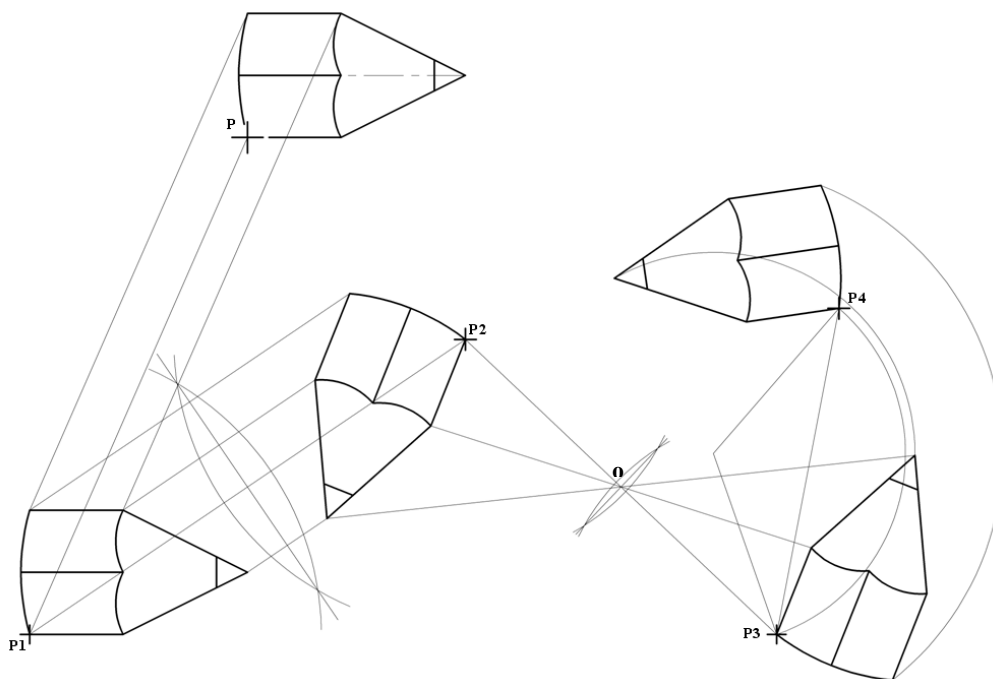
Q.4 - Development



Elevation (16)	
4	Frustum B
3	Elevation A
9	Sphere C : height of centre (2), locate sphere centre (4), draw sphere (2), cable (1)
Plan (10)	
4	Frustum B (2,2)
2	Cylinder A
4	Sphere C : Project centre from elev. (1), draw sphere (2), hanger (1)
Development of cylindrical surface A (18)	
6	Stepped out length of developed curve (3 correct increment, 3 correct No.)
3	Projecting Heights
3	Locate points
6	Drawing the required development
Development of conical surface B (16)	
2	Determine length of extreme generator
2	Swing arc equal to extreme generator
6	Stepped out length of developed curve (3 correct increment, 3 correct No.)
2	Swing arc equal to frustum
4	Drawing the required development
10	Drafting, accuracy, presentation

Total Marks 70

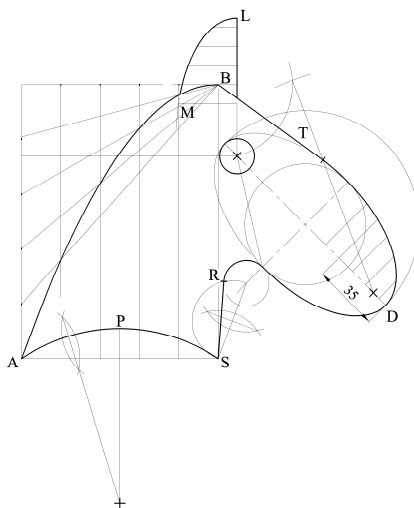
Q.5 - Transformation Geometry



Setting up (8)	
4	Construction outline
4	Complete figure: Arcs (2), lines (2)
Translation (12)	
4	Lines projected parallel to P – P1 .
4	Locating key image points.
4	Drawing the image figure accurately.
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.
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



Parabola (12)	
8	Construction to determine points on the parabola (2,2,2,2)
4	Drawing of parabola AB
Ellipse (22)	
6	Locate focal pts, axis and minor circle
6	Determine major axis length EF or EF₁ and draw major circle
6	Locating additional points on the curve (2, 2, 2)
4	Drawing the curve
Tangent BT (5)	
2	Draw arc BF or BF₁ (1), Draw major axis to cut arc (1)
3	Locate point of contact (1), Draw tangent (2)
Curve LM (8)	
2	Draw ordinate 35mm from vertex
4	Identify vertical and horizontal distances for three points (2,2)
2	Draw the curve LM
Tangent RS (6)	
2	Arc R12
4	Line from S to arc centre, Bisect, Point of Contact, Tangent RS (1,1,1,1)
Arc APS (6)	
3	Locate pt P , Bisect chord AP or PS
3	Locate centre of arc (1), Draw arc (2)
Completion (1)	
1	Eye
10	Drafting, accuracy, presentation

Total Marks 70