



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2017

Marking Scheme

Technical Graphics

Higher Level

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

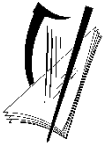
Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student 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.

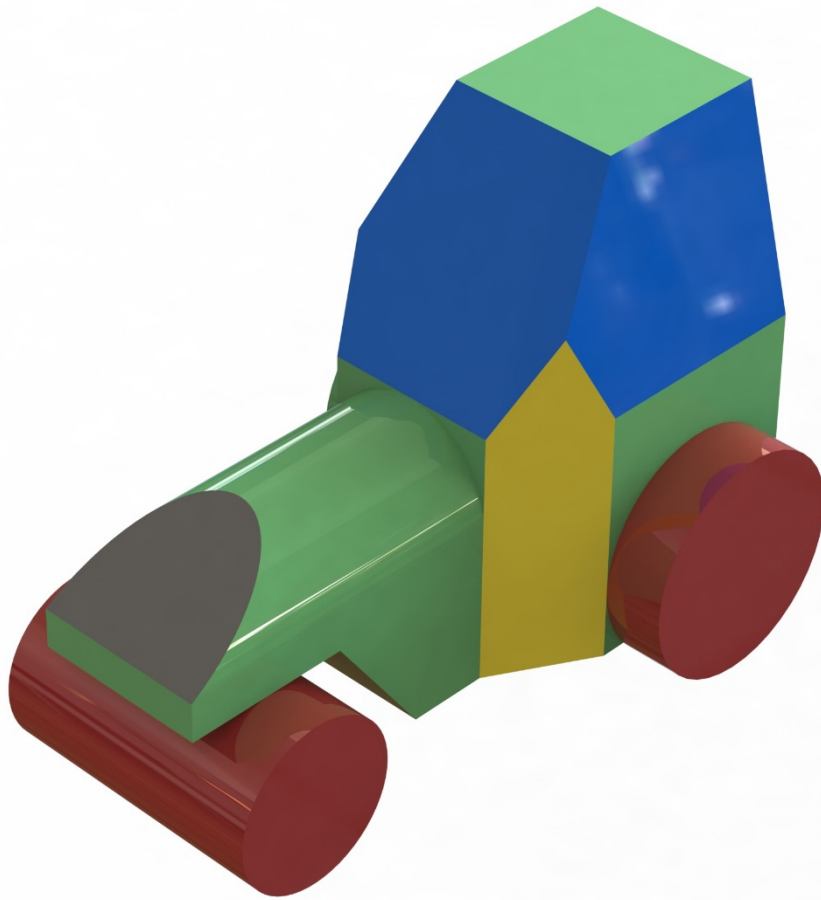
Future Marking Schemes

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



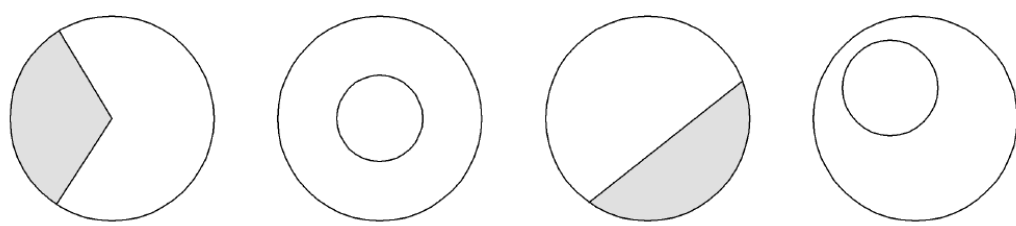
Higher Level ***Marking Scheme***

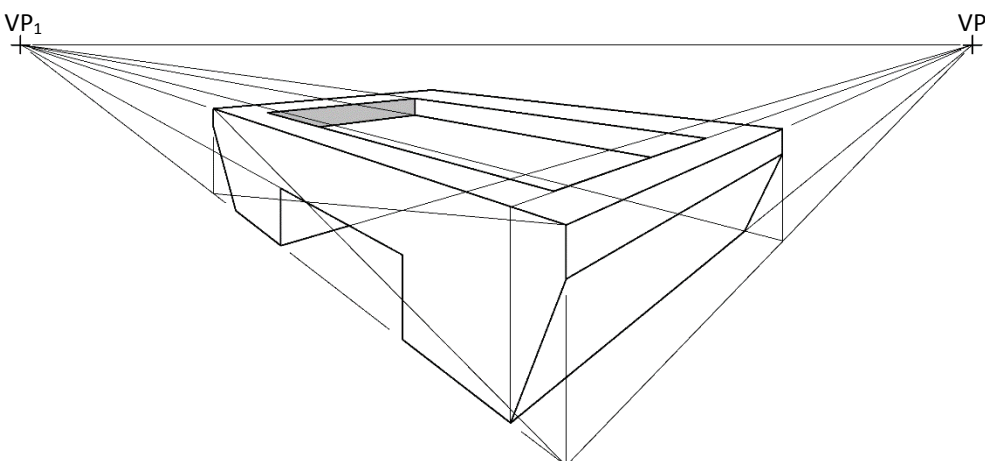
Section A and B

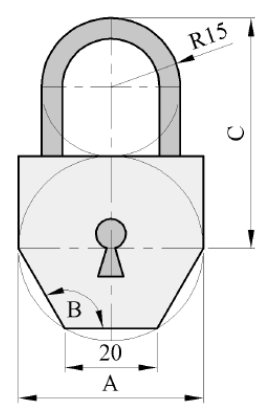
Section A – any ten questions from this section

Section B – any four questions from this section

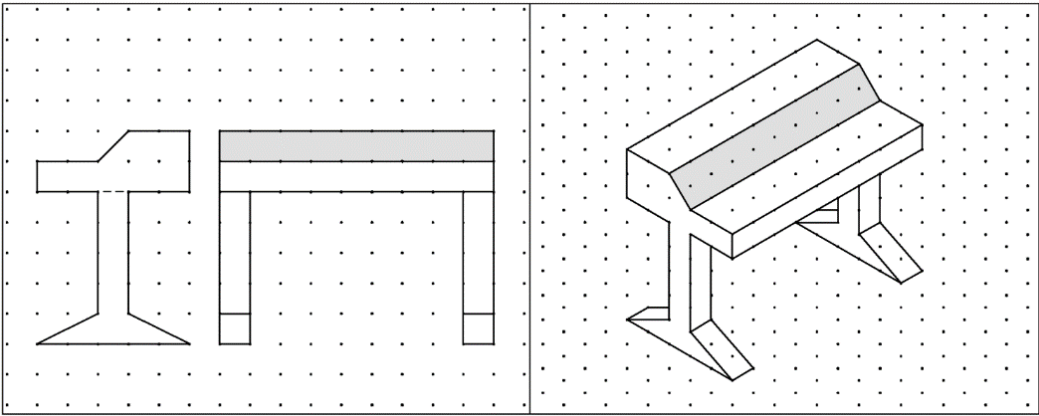
Section A – any ten questions from this section

Q1	
	<p>Sector Concentric Segment Eccentric</p>
12	Four diagrams, 3 marks for each correct label.

Q2	
3	Constructions: back corner (2), mid pt (1)
9	Complete perspective view – 9 lines

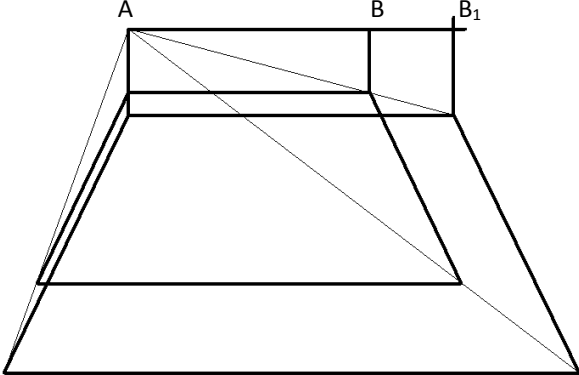
Q3		<p>A = 40</p> <p>B = 120°</p> <p>C = 50</p>
4	A = 40	
4	B = 120°	
4	C = 50	

Q4



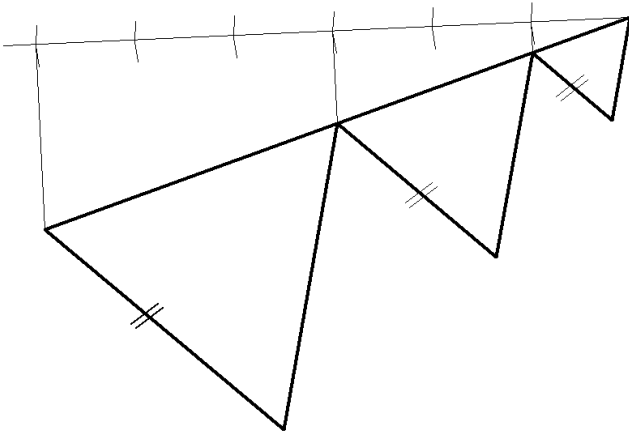
6	Top
4	Legs
2	Colour / Shade

Q5

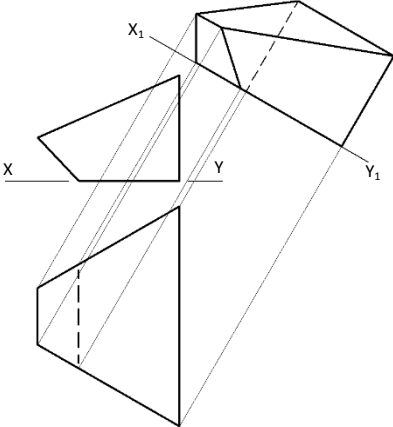


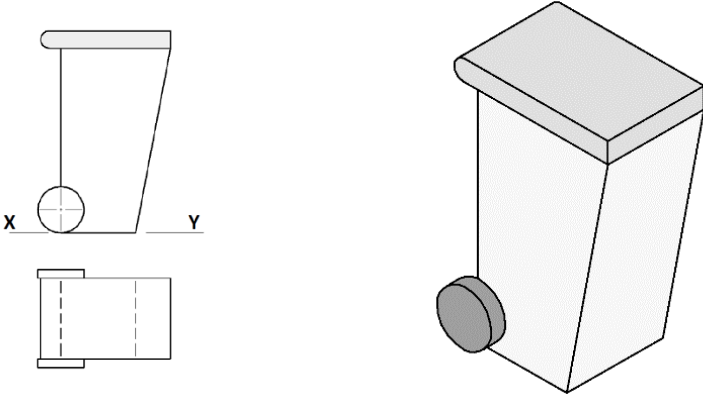
2	Vertical line from B_1	3	Establish ratio AB to AB_1
3	Radiating lines from A	2	Find required lengths
7	Complete lampshade	7	Complete lampshade

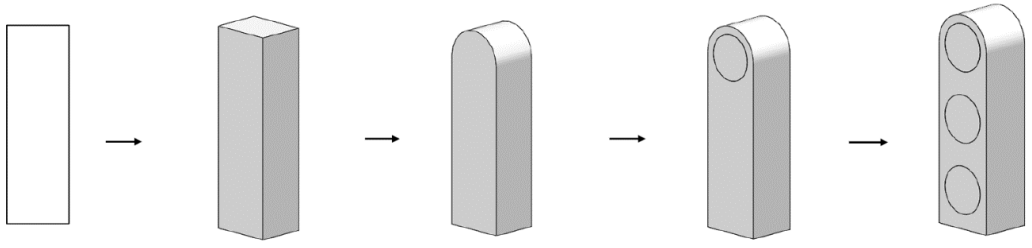
Q6



6	Division: line (2), six equal divisions (2), parallel lines (2)
6	Construct flags

Q7		
	3	Project perpendicular to X_1-Y_1
	2	Marking heights in auxiliary view
	7	Complete bunker (6), Hidden detail (1)

Q8		
	8	Bin depicted in a good quality freehand pictorial sketch
	4	Appropriate shading or colour

Q9					
		Extrude / Push / Pull	Fillet	Circle	Copy / Array / Linear Pattern
12	Extrude, Fillet, Circle, Copy (4 marks for each correct term)				

Q10

8	Locate focal points – 4 marks each
4	Construction arcs (2), Location of point of contact (2)

Q11

8	Rotating points about O
4	Completion of set-square in rotated position

Q12

1. B 2. C 3. A

4	1. = B
4	2. = C
4	3. = A

Q13

4	Step 2 parallel lines (2, 2)	Bisect angle (2) Parallel line (2)
6	Identify centre and draw football	
2	Locate points of contact	

Q14

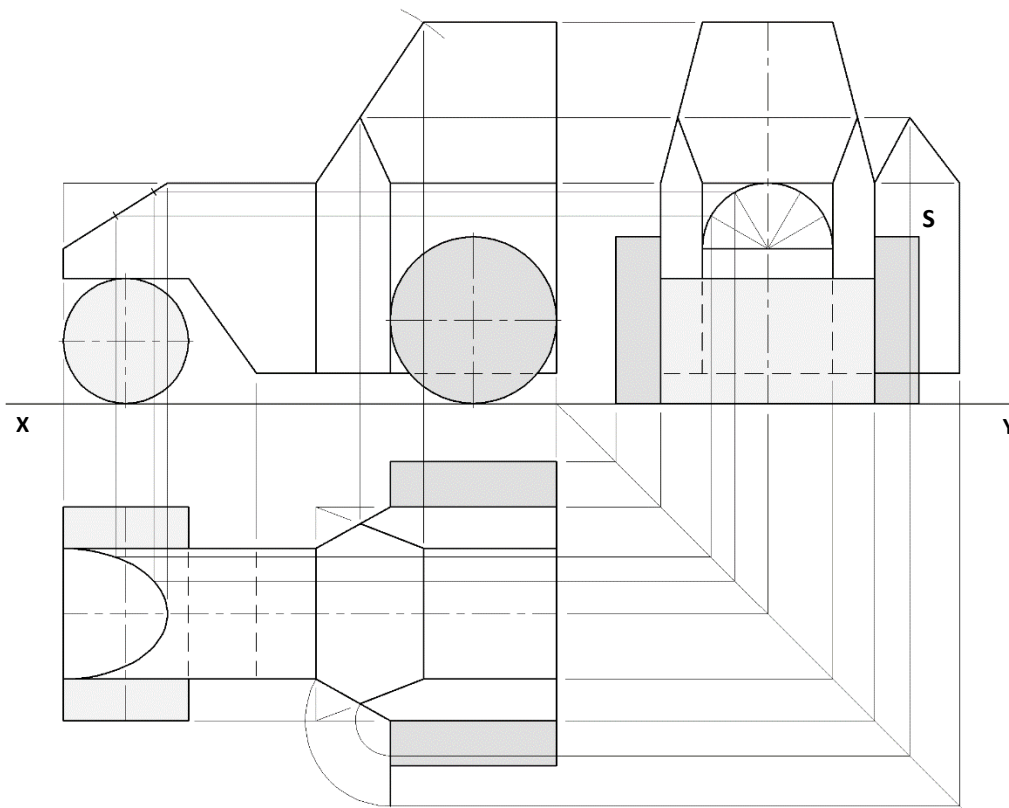
6	Shadow of cone
6	Shadow of sphere

Q15

8	Four points, 2 marks each
4	Complete line

Section B – any four questions from this section

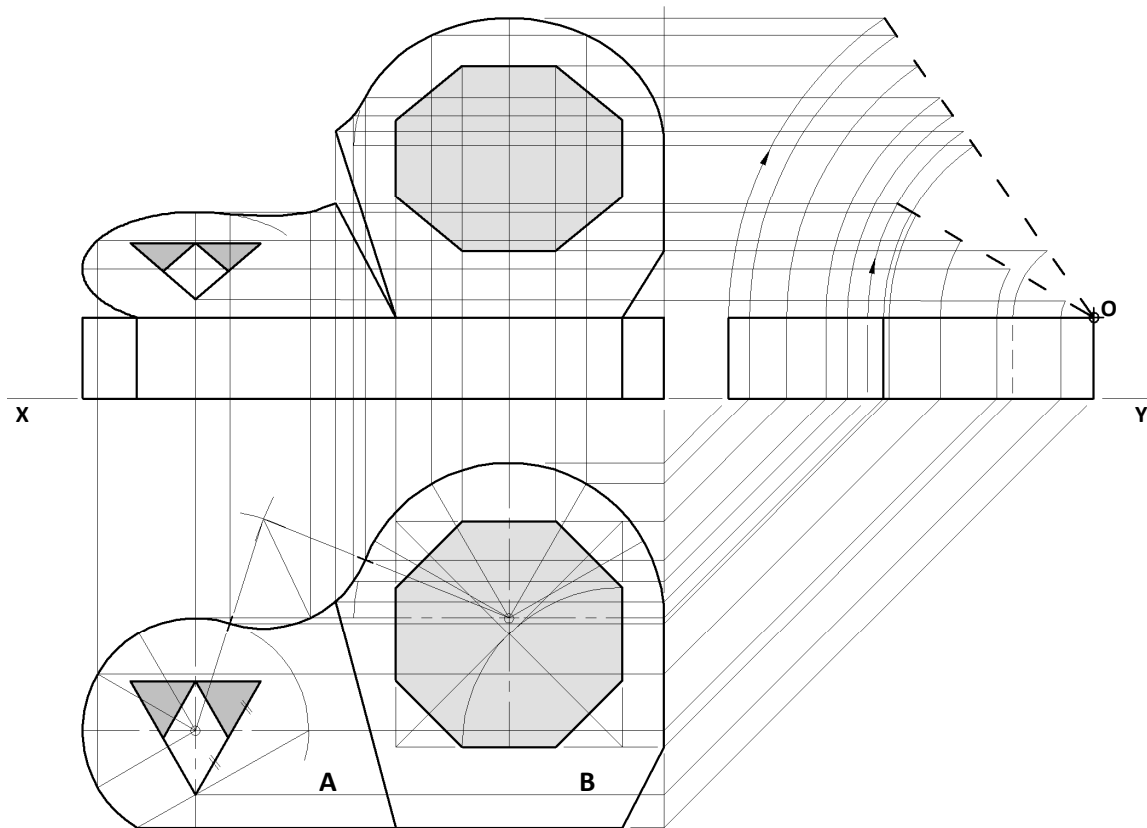
Q.1 – Orthographic projection.



Elevation (22)		
11	Engine	
6	Roller cab	
4	Rollers	
1	Hidden detail	
Plan (19)		
2	Engine	
6	Roller cab	
4	Rollers	
6	Elliptical curve: Points in EV, project to elev, project to plan. Draw (1,1,2,2)	
1	Hidden detail	
End View (15)		
3	Engine – line (1), circle (2)	
6	Roller cab	
4	Rollers	
2	Hidden detail	
True Shape (4)		
4	Rotation Method	Auxiliary Method
	Project from plan (1), project heights (1), completion (2)	New XY lines (1), transfer heights (1), completion (2)
10	Drafting, accuracy, presentation	

Total Marks 70

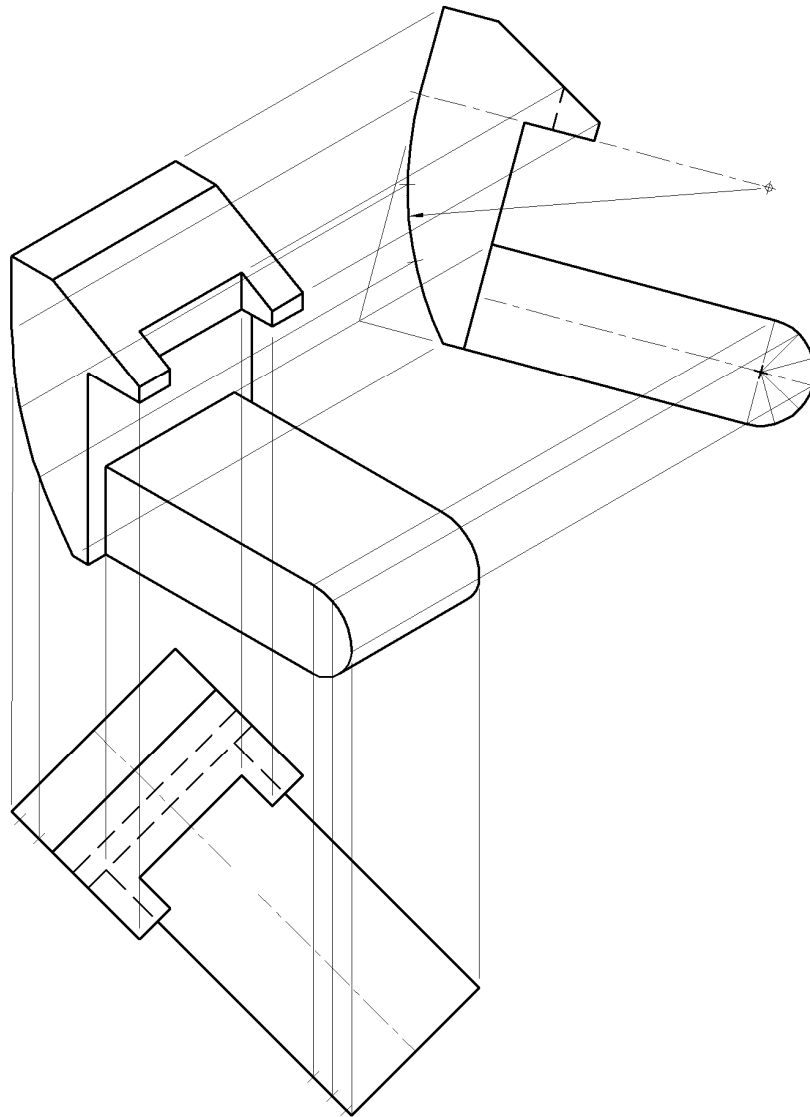
Q.2 - Orthographic, Rotation, Elevation.



Given Plan (20)	
10	Base: lines (6), R48 (2), R35 (2)
2	R34: Establish centre (1), circle (1)
1	75° line
7	Complete plan: octagon (4), Equilateral triangle logo (3)
Given End View (6)	
4	Base – 6 lines
1	55° angle
1	30° angle
New Figure (34)	
2	Projection of points to end view
2	Rotation of points in end view
2	Projections from end view to new figure in elevation
2	Projections from plan to new figure in elevation
6	Base
9	Lid A : outline curves (3 + 2), line (1), equilateral logo (3)
11	Lid B : lines (3), outline curves (3 + 1), octagon (4)
10	Drafting, accuracy, presentation

Total Marks 70

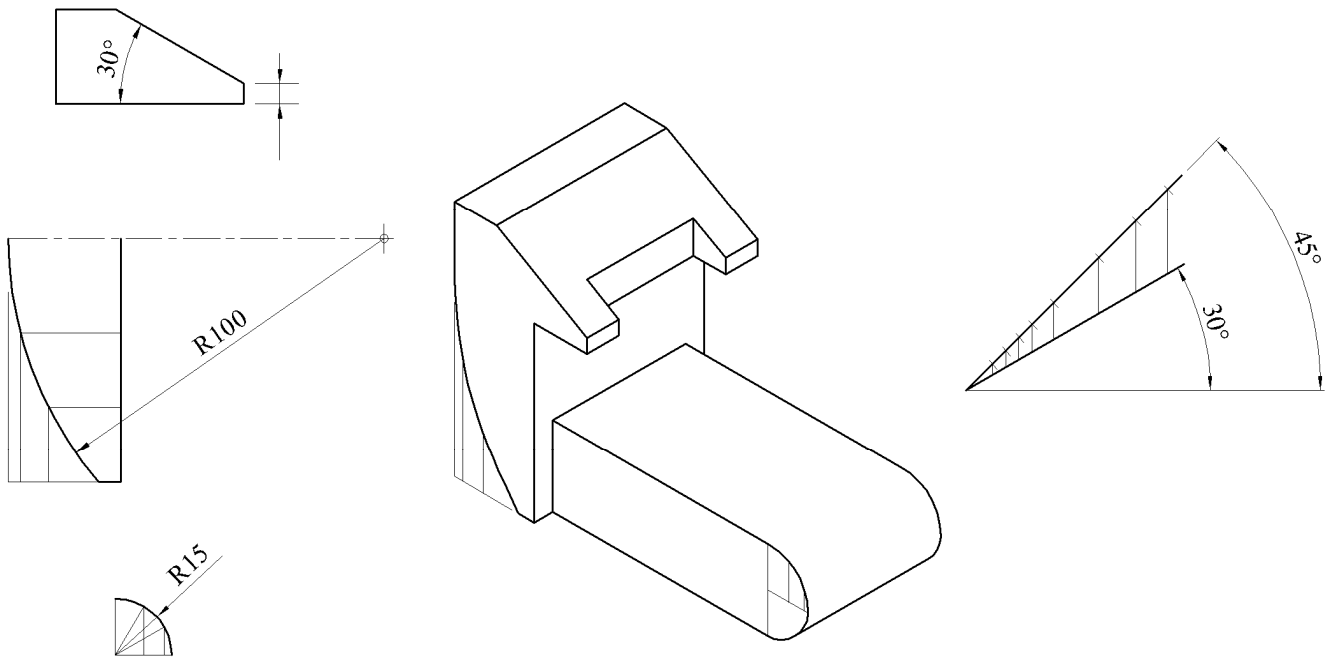
Q.3 (a) - Isometric Projection (Axonometric Axes Method)



Axonometric Axes Method	
Elevation (13)	
9	Body – lines (7), arc (2)
3	Track
1	Hidden detail
Plan (13)	
8	Body outline
3	Track
2	Hidden detail
Completion of Isometric Projection (34)	
12	Body outline
4	Front curve
6	Body recess
12	Track – surfaces (6), curves (3,2,1)
10	Drafting, accuracy, presentation

Total Marks 70

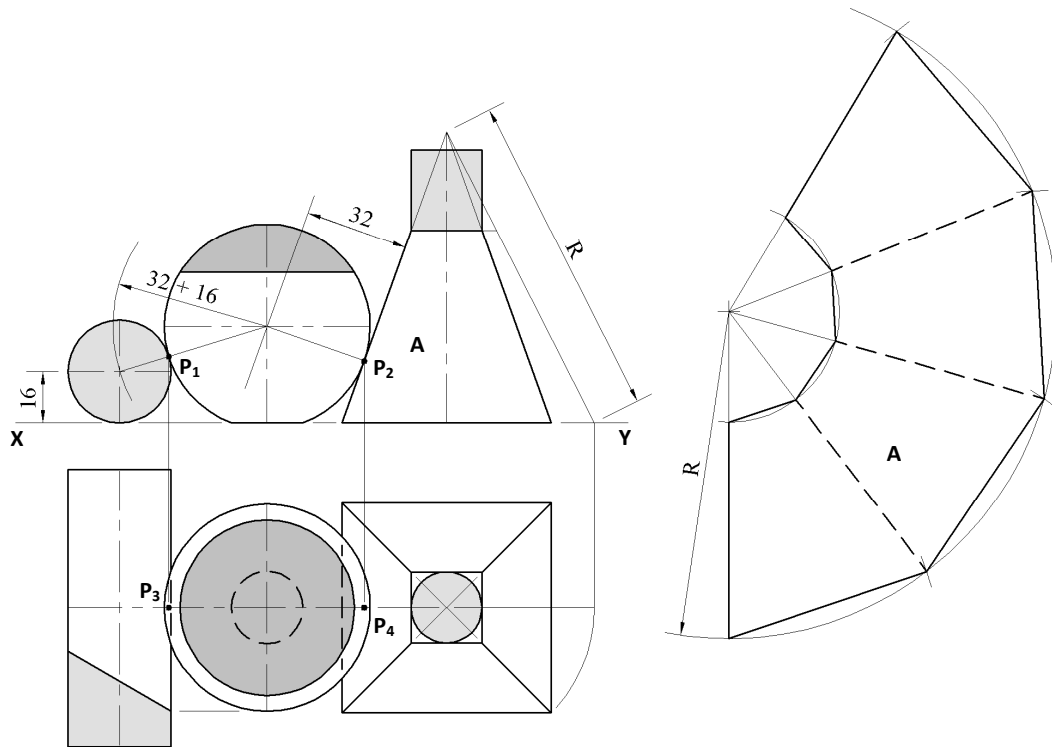
Q.3 (b) - Isometric Projection (Isometric Scale Method)



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 from 45° line onto 30° line
Construction of treadmill (12)	
3	Apply measurements required for Treadmill
9	Constructions required for treadmill (3,3,3)
Isometric Projection (6)	
6	Direction of axes (2,2,2)
Completion of Isometric Projection (34)	
12	Body outline
4	Front curve
6	Body recess
12	Track – surfaces (6), curves (3,2,1)
10	Drafting, accuracy, presentation

Total Marks 70

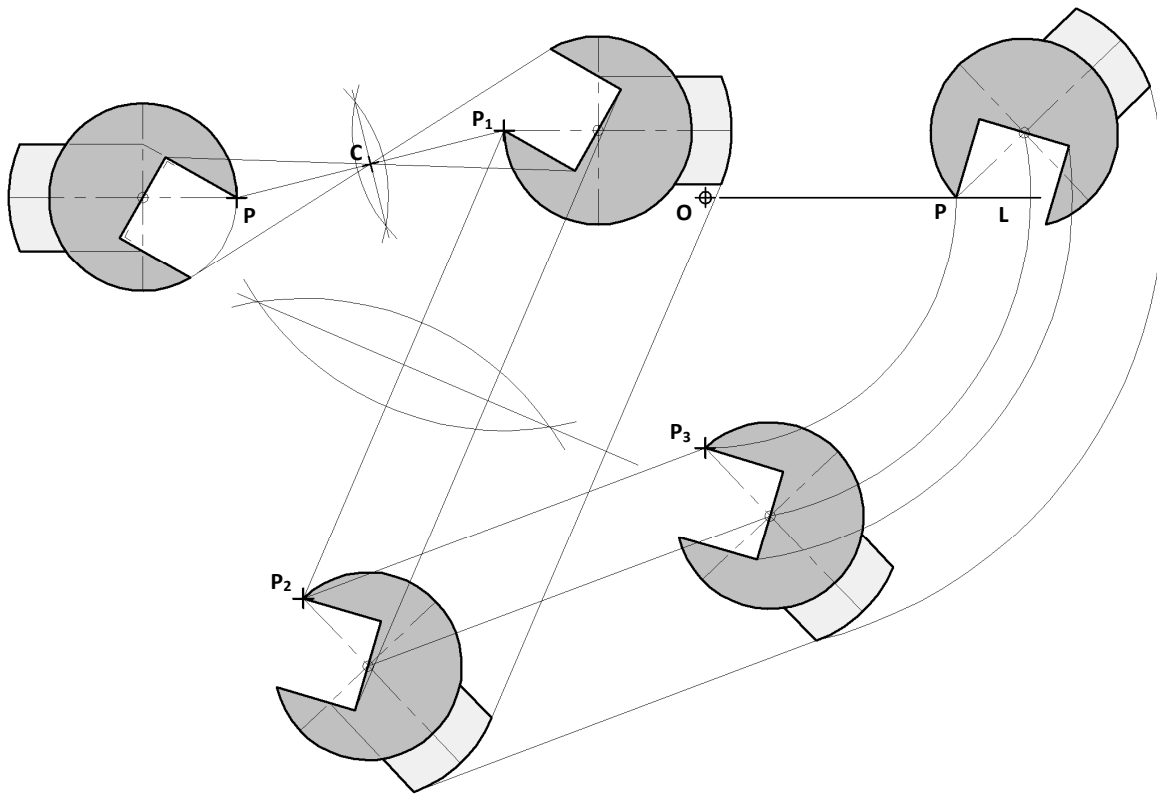
Q.4 - Development



Elevation (20)	
6	Perfume Bottle
8	Cream container: Height (1), locate sphere centre (3), draw sphere (2), lines (2)
6	Lipstick: Height (1), locate cylinder centre (3), draw cylinder (2)
Plan (16)	
7	Perfume bottle: lines (6), circle (1)
4	Cream container: circles (2,1,1)
3	Lipstick
2	Hidden detail
Points of contact (8)	
8	P ₁ , P ₂ , P ₃ , P ₄ – 2 marks each
Development of surface A (16)	
2	True length of edge
2	Swing arc of correct true length
4	Stepping out length of square: correct increment (2), correct number (2)
2	Swing arc equal to true length of truncation
6	Drawing the required development
10	Drafting, accuracy, presentation

Total Marks 70

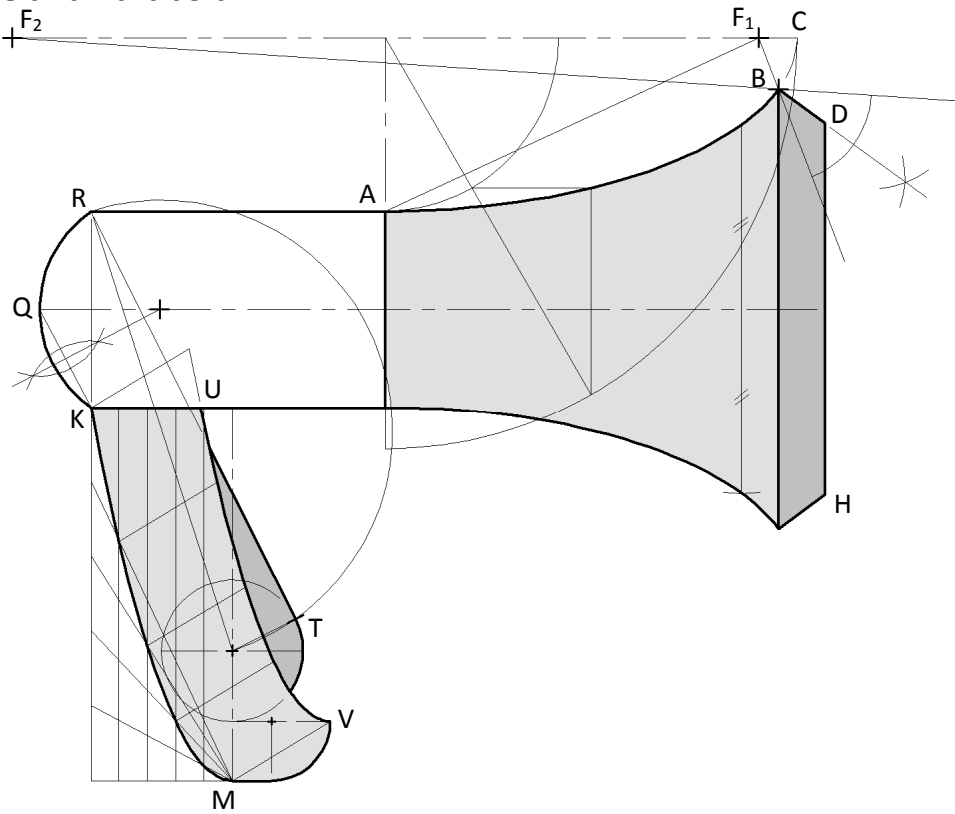
Q.5 - Transformation Geometry



Setting up (8)	
4	Construction outline: R26 Circle (2), lines (1), R40 (1)
4	Complete logo (1, 2, 1)
Central Symmetry (12)	
4	Locate pt C (2), project lines through C (2)
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
Translation (12)	
4	Lines projected parallel to P₂ – P₃
4	Locating key image points
4	Drawing the image figure accurately
Rotation (16)	
4	Location of pt P on line OL
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



Ellipse (20)		
4	Draw minor circle (2), locate focal pt. F_1 (2)	
4	Determine major axis length (2), draw major circle (2)	
6	Locating additional points on the curve (2,2,2)	
6	Drawing the elliptical curves (4,2)	
Complete body (12)		
3	Line DH (1), locate B (1), locate F_2 (1)	
3	Join B to focal pts (2), bisect F_1BF_2 (1)	
3	Draw normals (2, 1)	
3	Complete body - 3 lines	
Curve KQR (4)		
1	Locate pt. Q	
2	Bisect QK or QR	
1	Draw arc	
Handle (24)		
8	Construction to determine points on the parabola (2,2,2,2)	
4	Drawing of parabola KM	
3	Base: Line (1), R15 (2)	
2	Identify ordinates for points on curve UV	Translate points parallel to MV
2	Draw the curve UV	
2	Draw arc R18	
3	Tangent: construction (2), tangent (1)	
10	Drafting, accuracy, presentation	

Total Marks 70