



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2016

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.

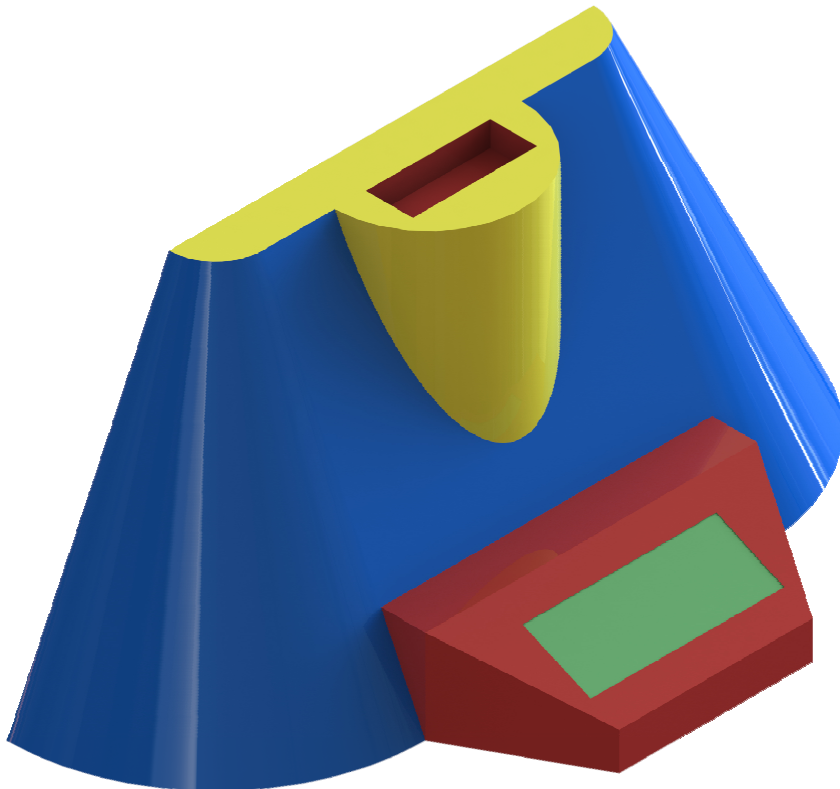
Future Marking Schemes

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, 2016

Technical Graphics



Higher Level ***Marking Scheme***

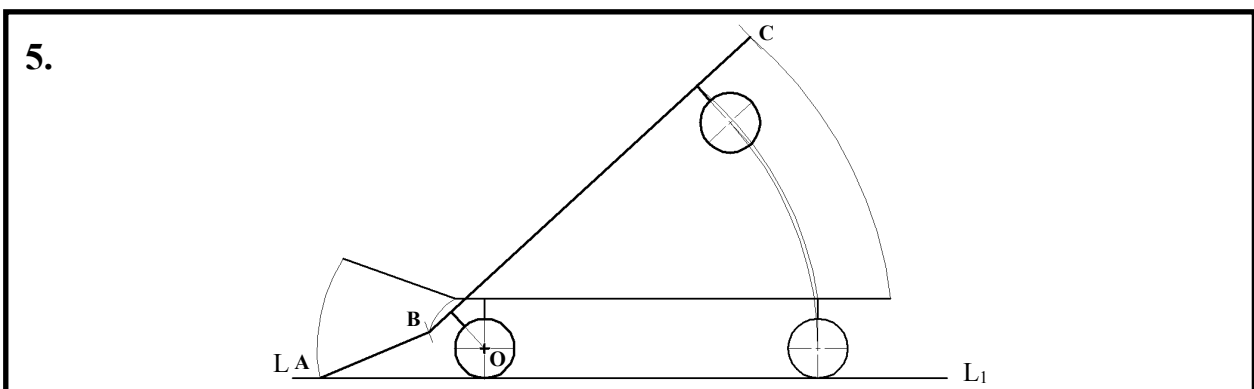
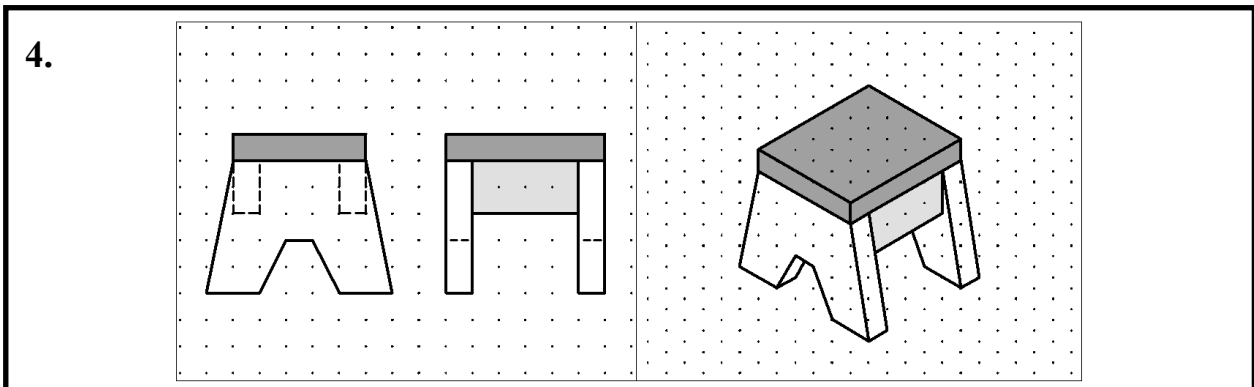
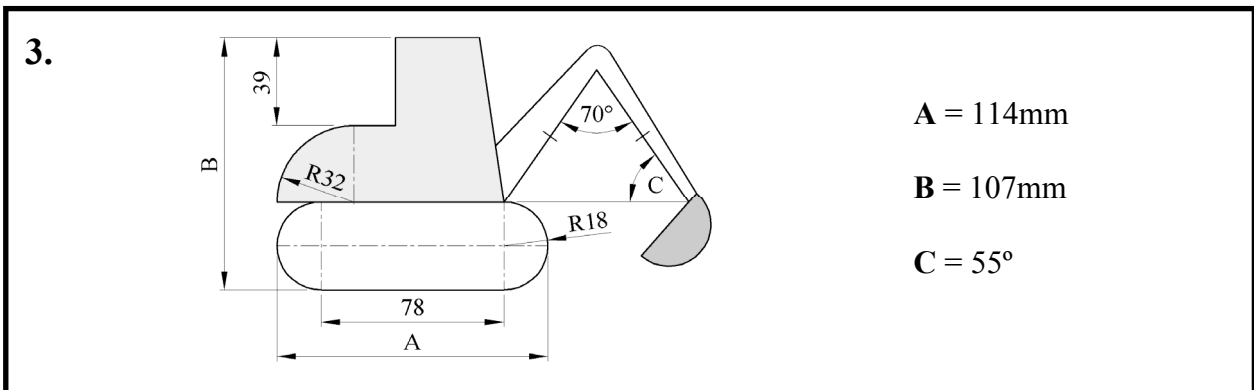
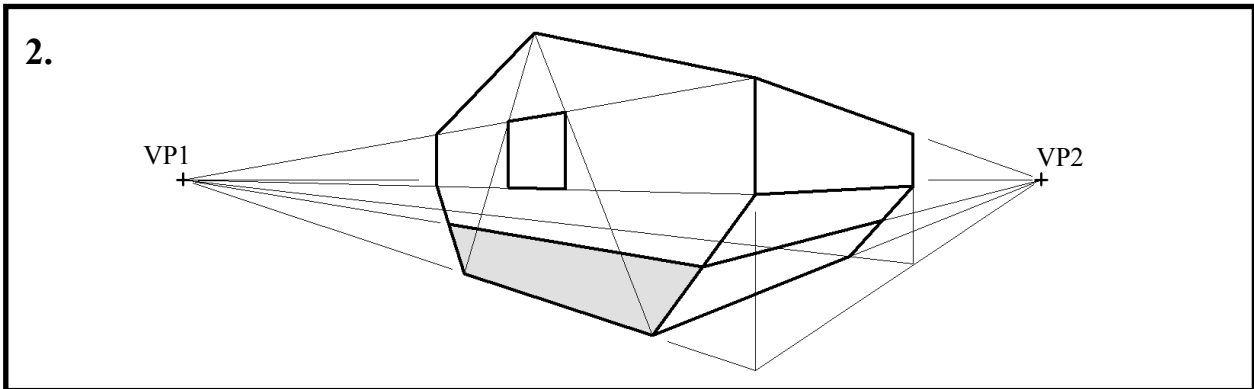
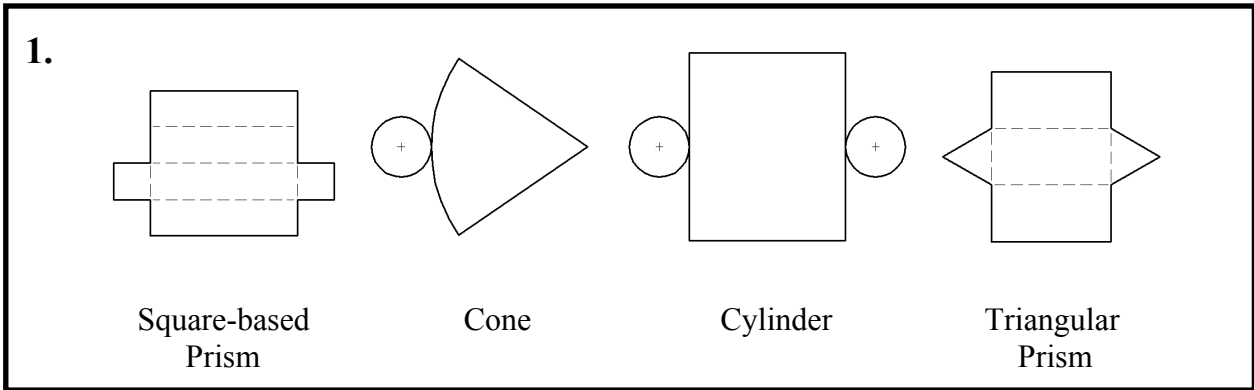
Section A and B

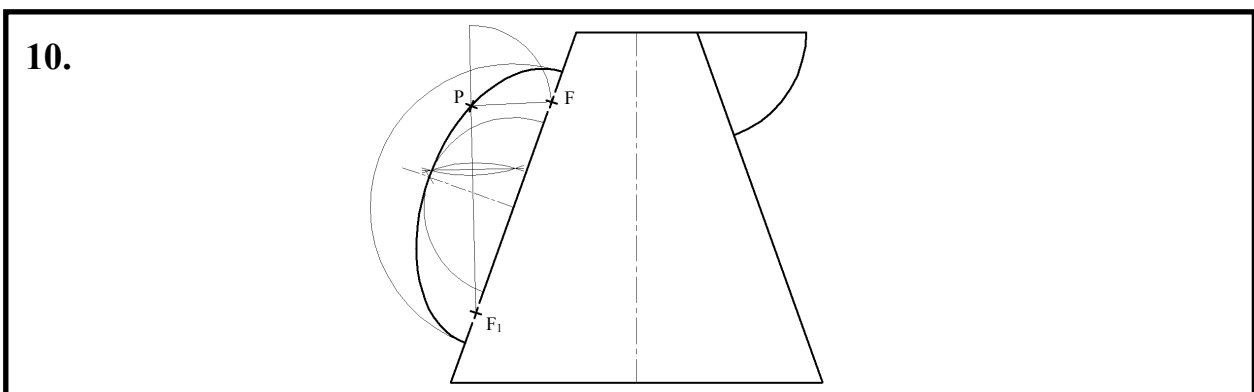
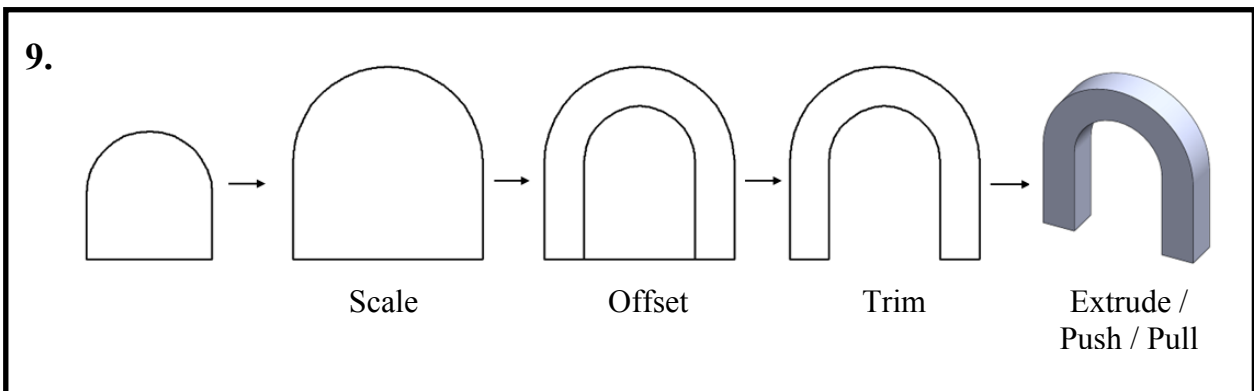
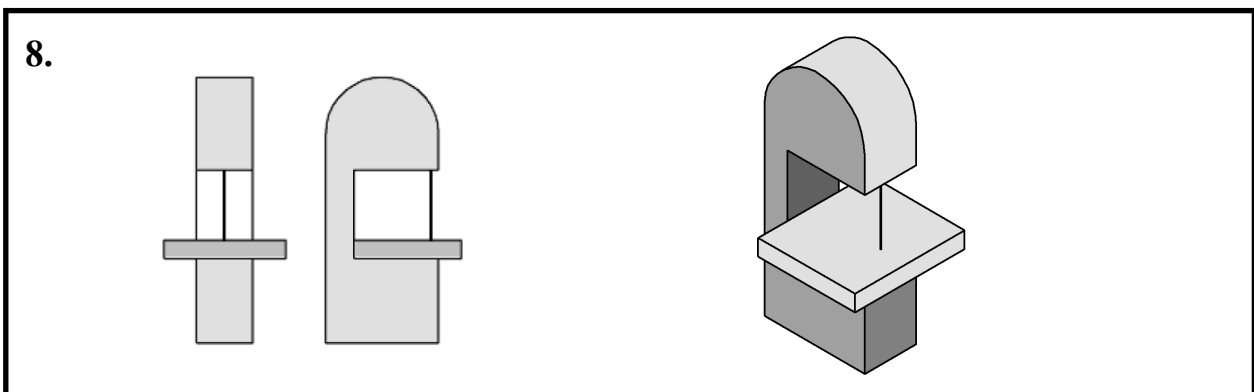
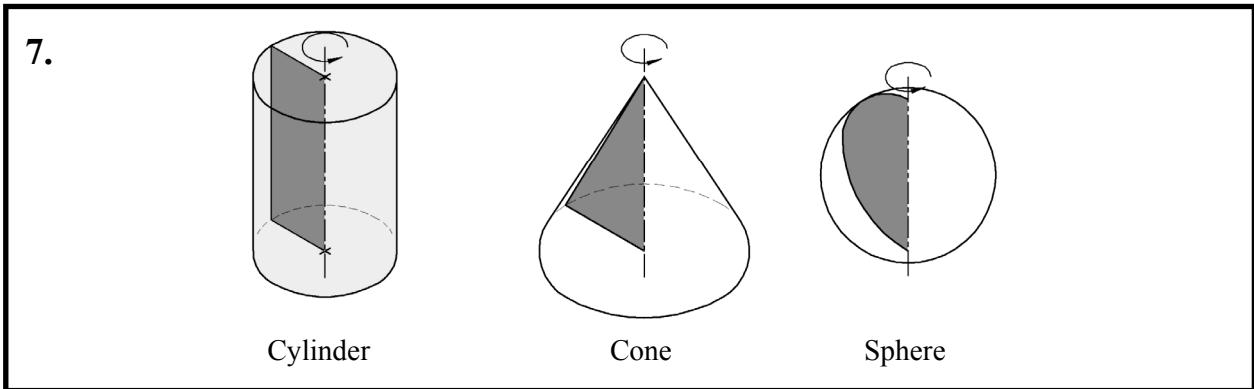
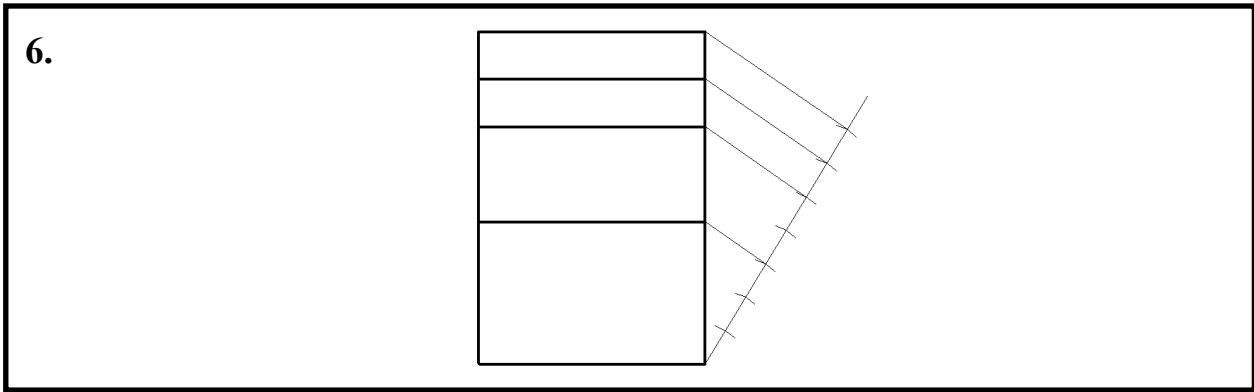
Section A – any ten questions from this section

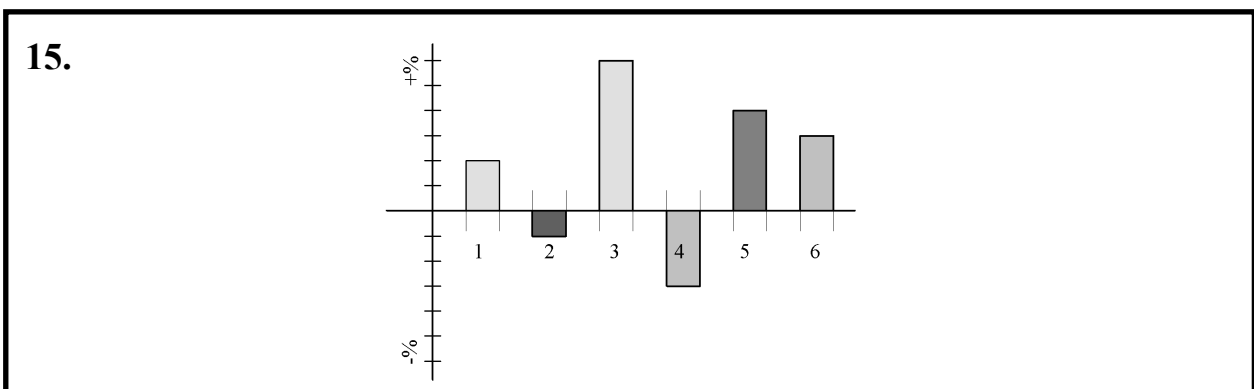
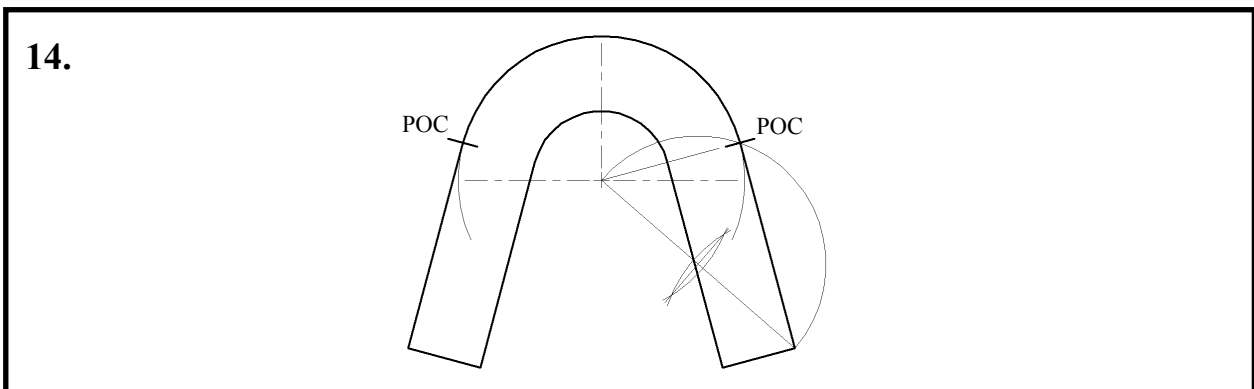
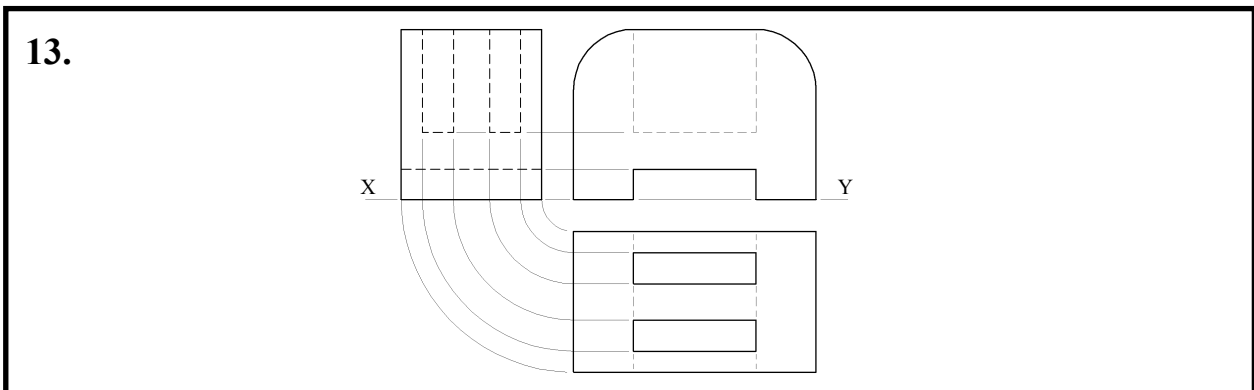
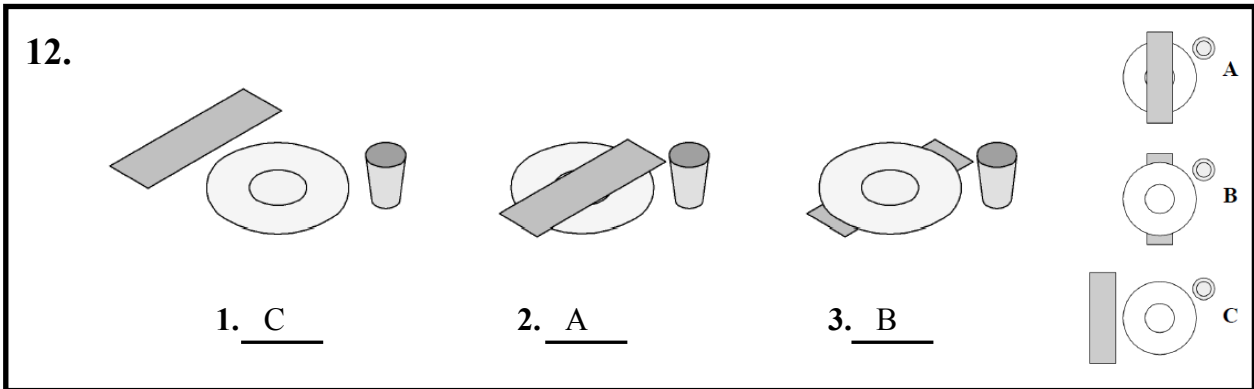
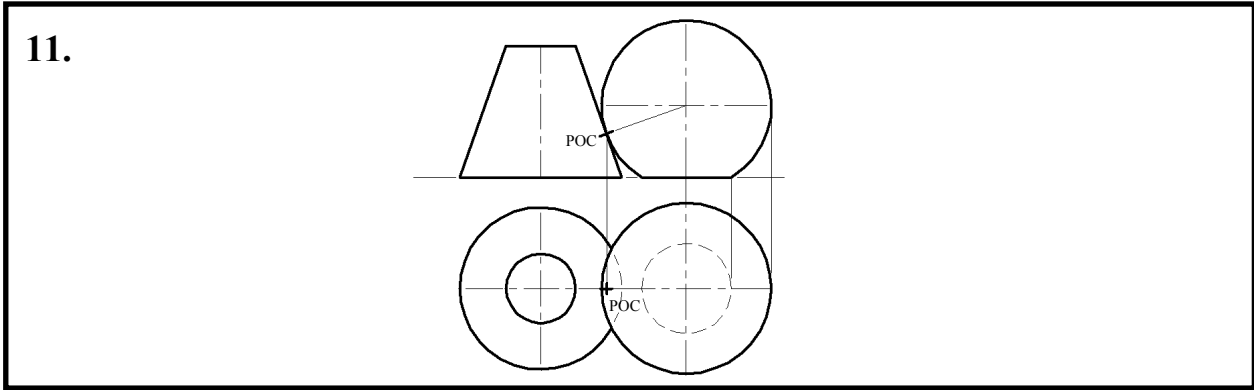
Section B – any four questions from this section

Section A – any ten questions from this section

Q1	12	Four diagrams, 3 marks for each correct label.
Q2	5	Constructions: back corner (3), locate opening (2)
	7	Seven lines, 1 mark each
Q3	4	A = 114mm
	4	B = 107mm
	4	C = 55°
Q4	6	Legs
	4	Seat and Rail
	2	Colour or Shade
Q5	4	Rotating points around O
	8	Completion of skateboard in rotated position
Q6	9	Division: line (2), seven equal divisions (3), parallel lines (4)
	3	Construct shelves
Q7	6	Name (2), Sketch of a cone (4)
	6	Name (2), Sketch of a sphere (4)
Q8	8	Bandsaw depicted in a <u>good quality</u> freehand pictorial sketch.
	4	Appropriate shading or colour.
Q9	12	Scale, Offset, Trim, Extrude (4 marks for each correct term)
Q10	2	Drawing FP and F₁P
	3	Determine half major axis; length (2), bisect (1)
	3	Draw major (1) and minor (2)
	4	Draw semi-ellipse
Q11	8	Plan: locate centre (2), draw circle (3), hidden detail (3)
	4	Locate POC: elevation (2), plan (2)
Q12	4	1. = C
	4	2. = A
	4	3. = B
Q13	6	Vertical projectors (4), Horizontal projectors (2)
	6	Hidden lines
Q14	6	Join centre to P/Q (1), bisect line (3), draw semi-circle (2)
	2	Locate points of contact
	4	Draw tangents
Q15	10	Five correctly-sized bars
	2	Colour or shade

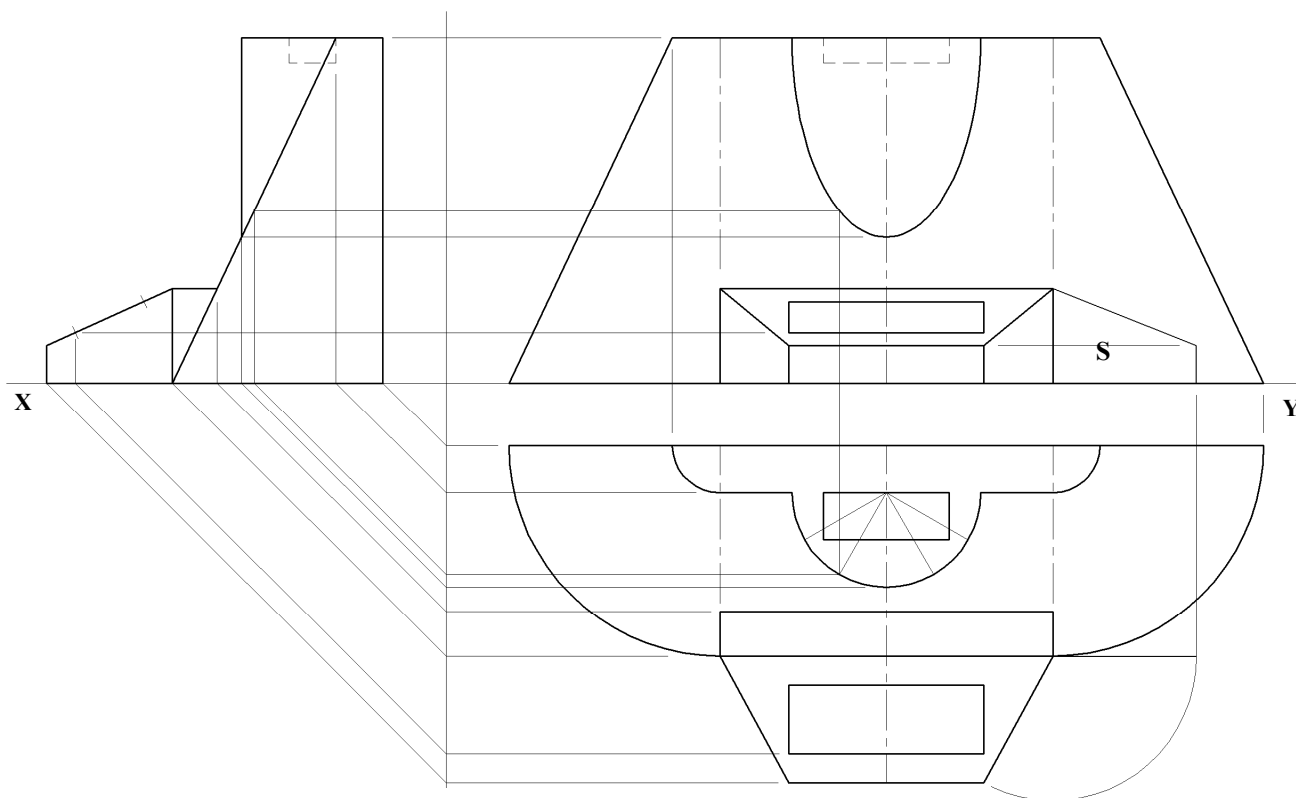






Section B – any four questions from this section

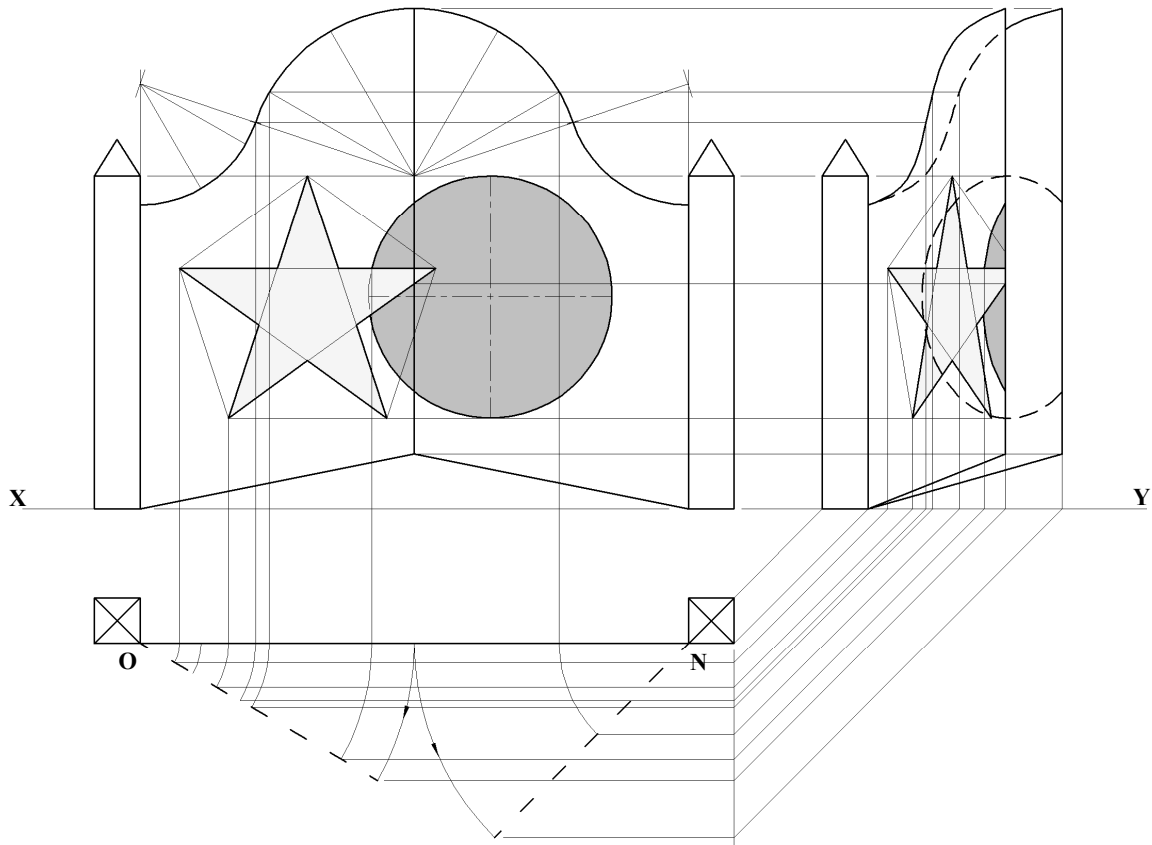
Q.1 – Orthographic projection.



Elevation (21)		
4	Speaker outline	
6	Control unit outline	
3	Centre panel	
6	Elliptical curve: Points in plan, project to EV, project to elev. Draw (1,1,2,2)	
2	Hidden detail	
Plan (19)		
7	Speaker Outline: Base (4). Top (3)	
8	Control unit outline (5), centre panel (3)	
4	Dock: Semi-circle (2), rectangle (2)	
End View (12)		
4	Speaker outline	
2	Dock	
4	Control unit	
2	Hidden detail	
True Shape (8)		
8	Rotate in plan	Project perpendicular
	Project from plan (3), project from elevation (2), completion (3)	New xy lines (3), transfer heights (2), completion (3)
10	Drafting, accuracy, presentation	

Total Marks 70

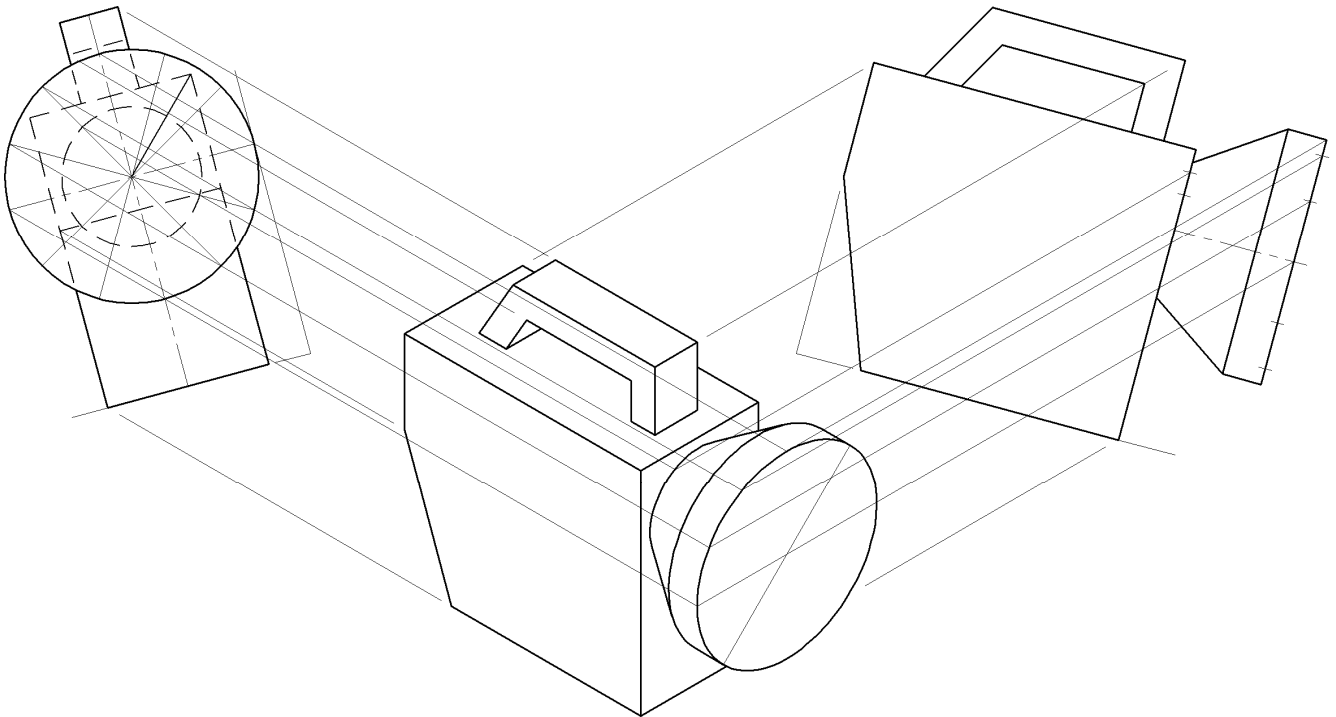
Q.2 - Orthographic, Rotation, End View.



Given Elevation (20)	
4	Pillars
2	R55 Circle
4	R40 Circles: Establish centre (2), circle (2)
3	Complete gate outline (3 lines)
7	Logo: Star (5), R40 Circle (2)
Given Plan (8)	
4	Pillars
2	30° angle (1), correct length (1)
2	45° angle (1), correct length (1)
New Figure (32)	
2	Projection of points to plan
2	Rotation of points in plan
2	Projections from plan to new figure in end view
2	Projections from elevation to new figure in end view
2	Pillar
10	Gates outline: Lines (4), Top curves (4, 2)
7	Logo: Star (5), Arc (2)
5	Hidden Detail
10	Drafting, accuracy, presentation

Total Marks 70

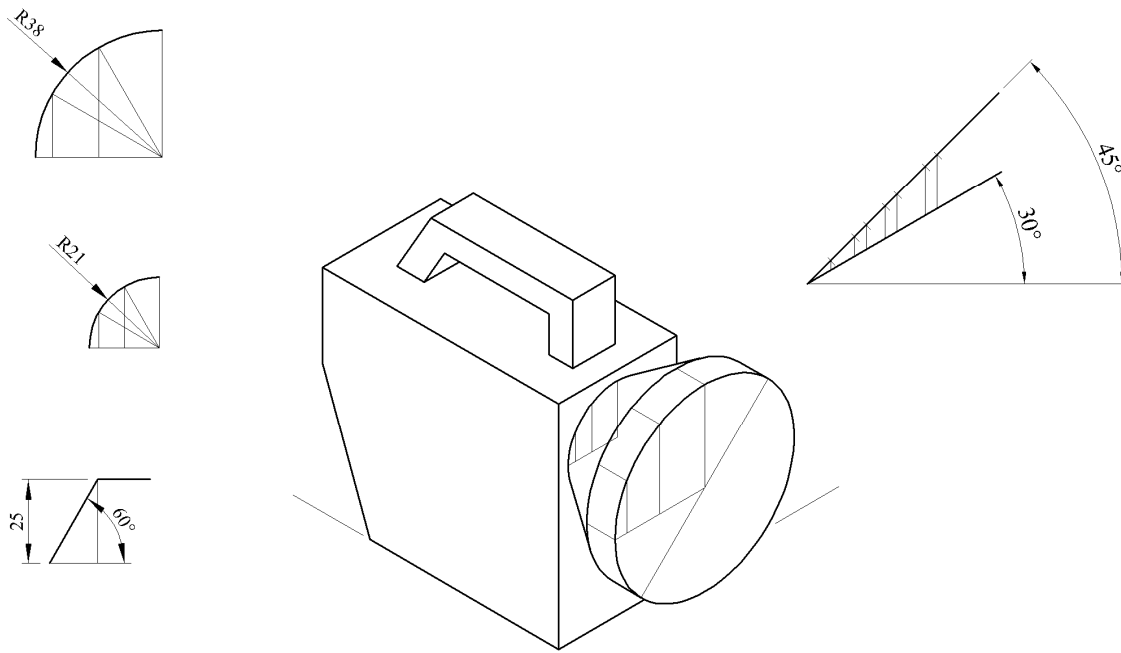
Q.3 (a) - Isometric Projection (Axonometric Axes Method)



Axonometric Axes Method	
Elevation (13)	
3	Torch body
4	Torch head
6	Handle
End View (13)	
5	Torch body
4	Circles
4	Handle
Completion of Isometric Projection (34)	
10	Torch body
10	Torch lense
6	Truncated cone
8	Handle (3, 2, 2, 1)
10	Drafting, accuracy, presentation

Total Marks 70

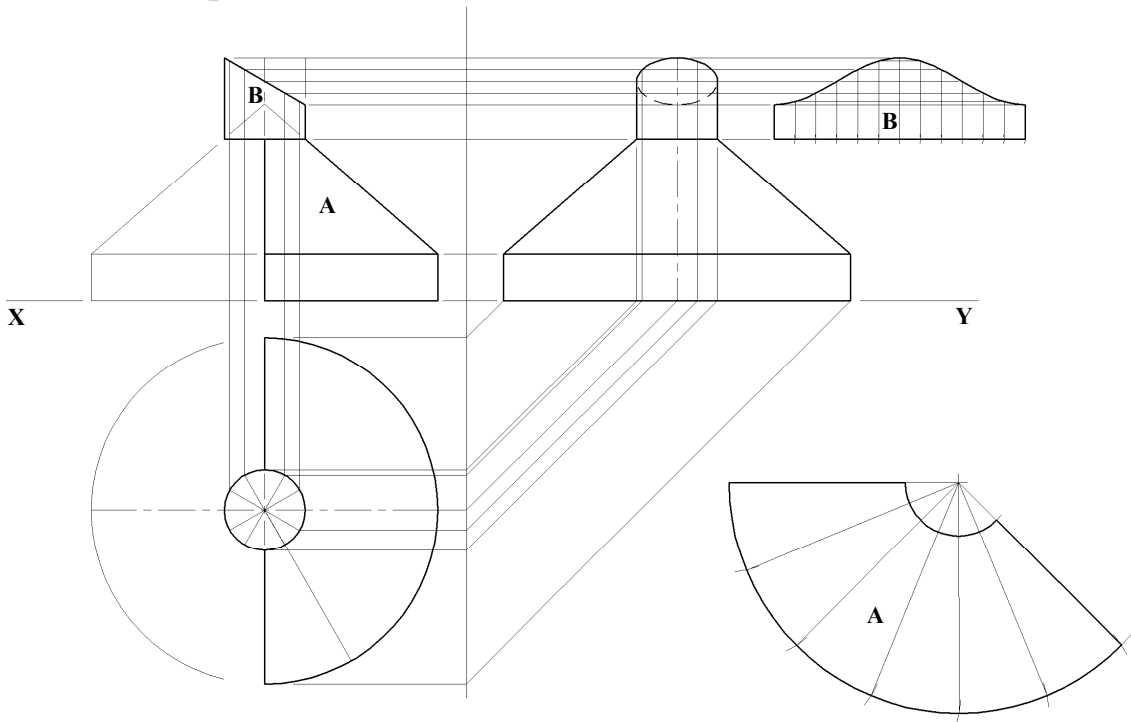
Q.3 (b) - Isometric Projection (Isometric Scale Method)



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 Torch (12)	
3	Apply measurements required for Torch
9	Constructions required for torch: curves (3,3), handle (3)
Isometric Projection (6)	
6	Direction of axes (2,2,2)
Completion of Isometric Projection (34)	
10	Torch body
10	Torch lense
6	Truncated cone
8	Handle (3, 2, 2, 1)
10	Drafting, accuracy, presentation

Total Marks 70

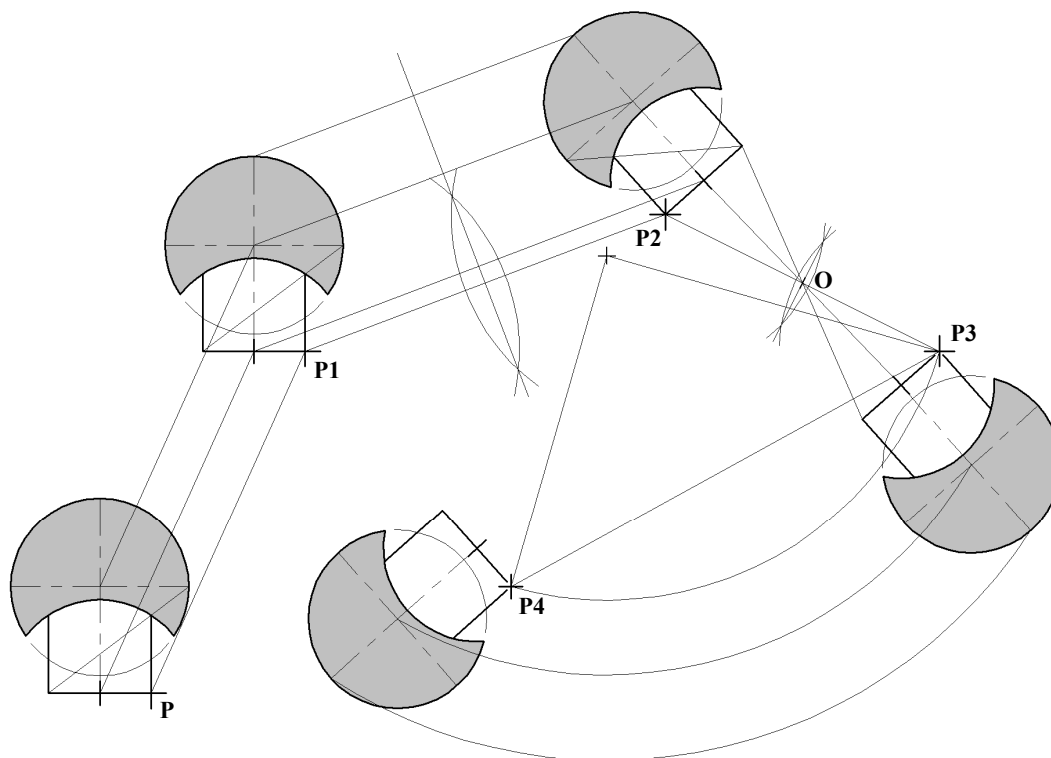
Q.4 - Development



Elevation (8)	
4	Base: cylinder (2), cone (2)
4	Truncated cylinder
Plan (6)	
4	Circles: Ø120 (2), Ø28 (2)
2	Line
End View (14)	
5	Base: cylinder (2), cone (3)
2	Cylinder outline
6	Elliptical curve: Points in plan, project to elev, project to EV, draw (1,1,2,2)
1	Hidden detail
Development of conical surface A (14)	
2	Determine length of extreme generator
2	Swing arc equal to extreme generator
4	Stepping out length of developed curve (2 correct increment, 2 correct No.)
2	Swing arc equal to frustum
4	Drawing the required development
Development of cylindrical surface B (18)	
4	Stepping out length of development (2 correct increment, 2 correct No.)
4	Projecting heights
4	Locating points
6	Drawing the required development
10	Drafting, accuracy, presentation

Total Marks 70

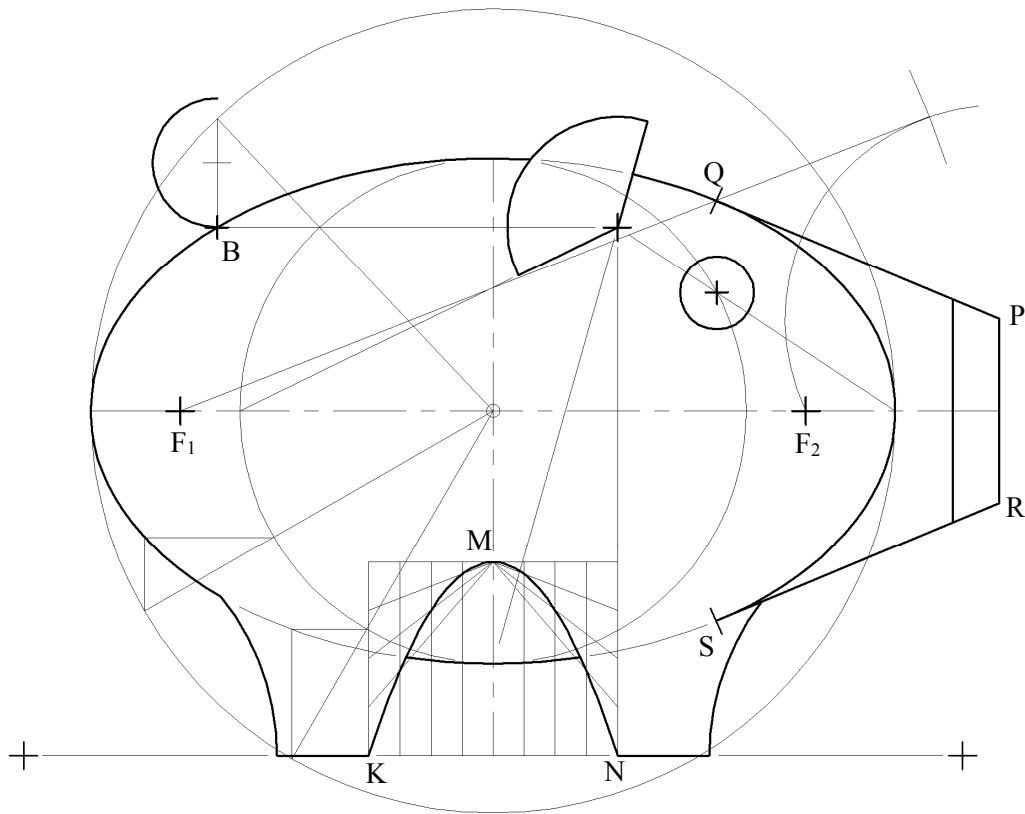
Q.5 - Transformation Geometry



Setting up (8)	
5	Construction outline: R26 Circle (2), lines (3)
3	Complete figure: arc construction (1), Arc (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 pt 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 45° 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



Ellipse (22)	
4	Draw minor circle (2), locate pt B (2)
8	Identify (6) and draw major circle (2)
6	Locating additional points on the curve (2, 2, 2)
4	Drawing the curve
Parabola (12)	
8	Construction to determine points on the parabola (2,2,2,2)
4	Drawing of parabola KMN
Tangents (14)	
2	Nose: line PR (1), parallel line (1)
2	Locate focal points
2	Swing arc PF₂
2	Swing major axis to cut arc
2	Locate points of contact Q and S
4	Draw tangents
Completion (12)	
4	Legs
4	Ear (2, 1, 1)
4	Tail (2), eye (2)
10	Drafting, accuracy, presentation

Total Marks 70