



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2018

Marking Scheme

Technical Graphics

Higher Level

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

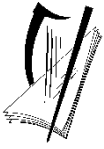
Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student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

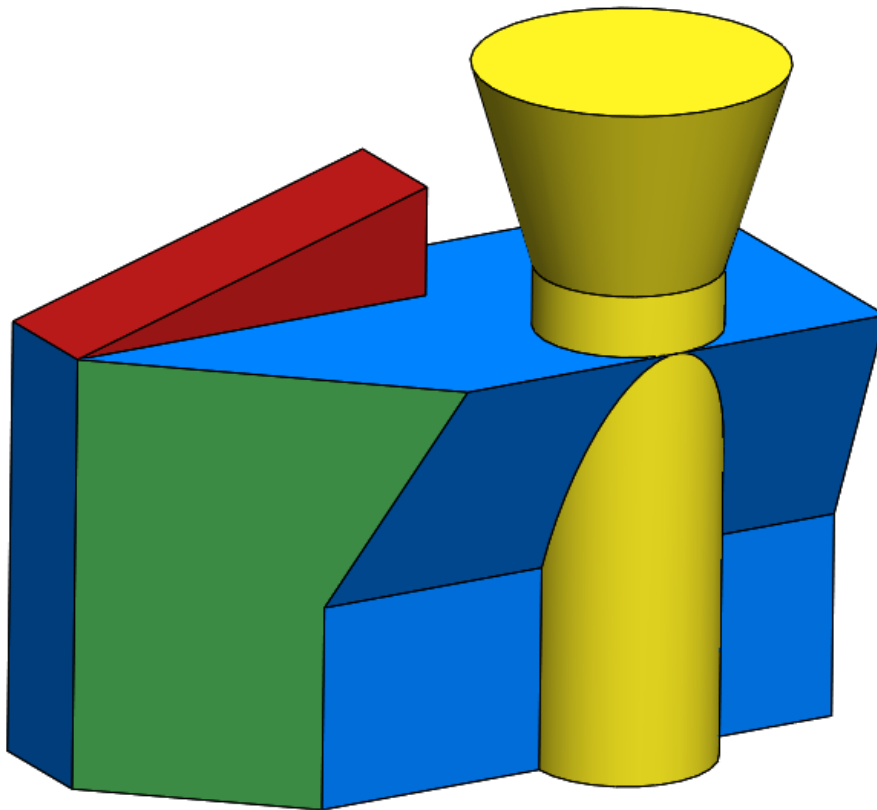
Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in 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.



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination, 2018

Technical Graphics

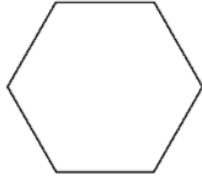


Higher Level
Marking Scheme


Section A and B

Section A – any ten questions from this section

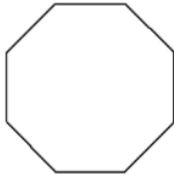
Q1



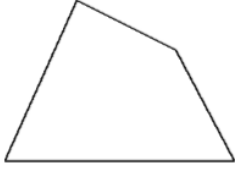
Hexagon



Parallelogram



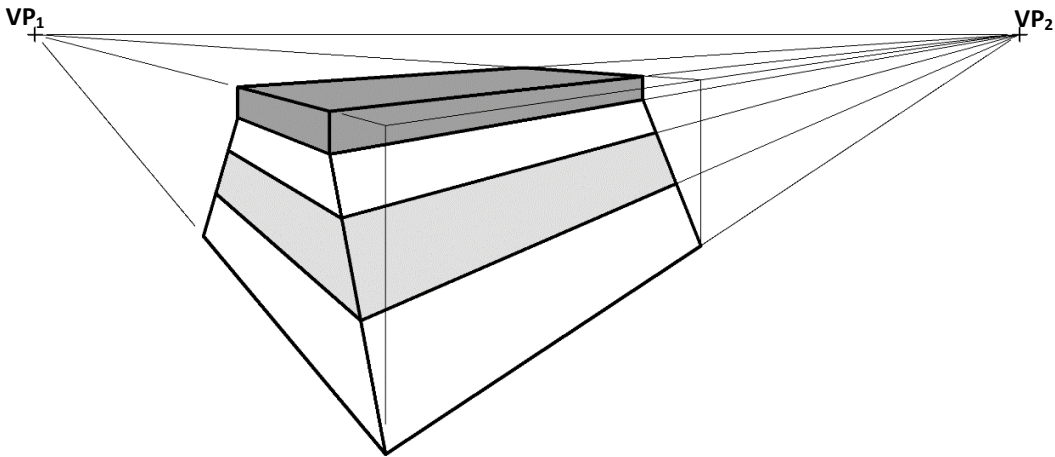
Octagon



Trapezoid

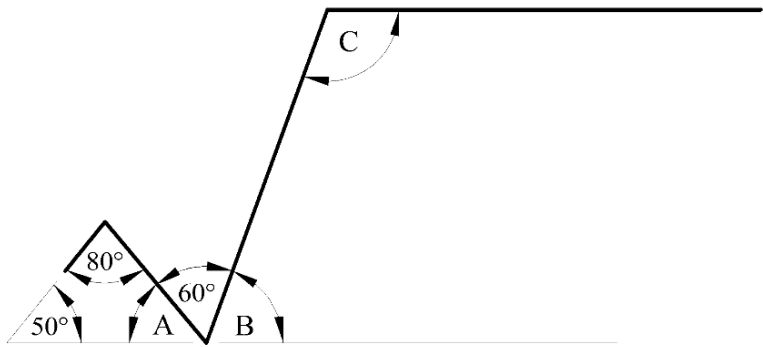
| | |
|----|--|
| 12 | Four diagrams, 3 marks for each correct label. |
|----|--|

Q2



| | |
|----|--------------------------------|
| 2 | Front corner construction |
| 10 | Front lines (6), Top lines (4) |

Q3



A = 50°

B = 70°

C = 110°

| | |
|---|-----------------|
| 4 | A = 50° |
| 4 | B = 70° |
| 4 | C = 110° |

| | | |
|-----------|---|---|
| Q7 | | |
| | 2 | Project perpendicular to X_1-Y_1 |
| | 2 | Marking heights in auxiliary view |
| | 8 | Complete lectern (6), Hidden detail (2) |

| | | |
|-----------|---|---|
| Q8 | | |
| | 9 | Stamp depicted in a good quality freehand pictorial sketch |
| | 3 | Appropriate shading or colour |

| | | | | |
|-----------|----|---|--|--|
| Q9 | | | | |
| | 12 | Ellipse, Dimension, Offset, Extrude (4 marks for each correct term) | | |

Q10

| | |
|---|---|
| 8 | Plan: locate centre (2), draw circle (4), hidden detail (2) |
| 4 | Locate POC: elevation (2), plan (2) |

Q11

| | |
|---|--|
| 4 | Determine Major Axis: draw F_1P (1) and F_2P (1), length (1), bisect (1) |
| 6 | Draw: Major (1), Minor (2), Ellipse (3) |
| 2 | Complete logo |

Q12

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

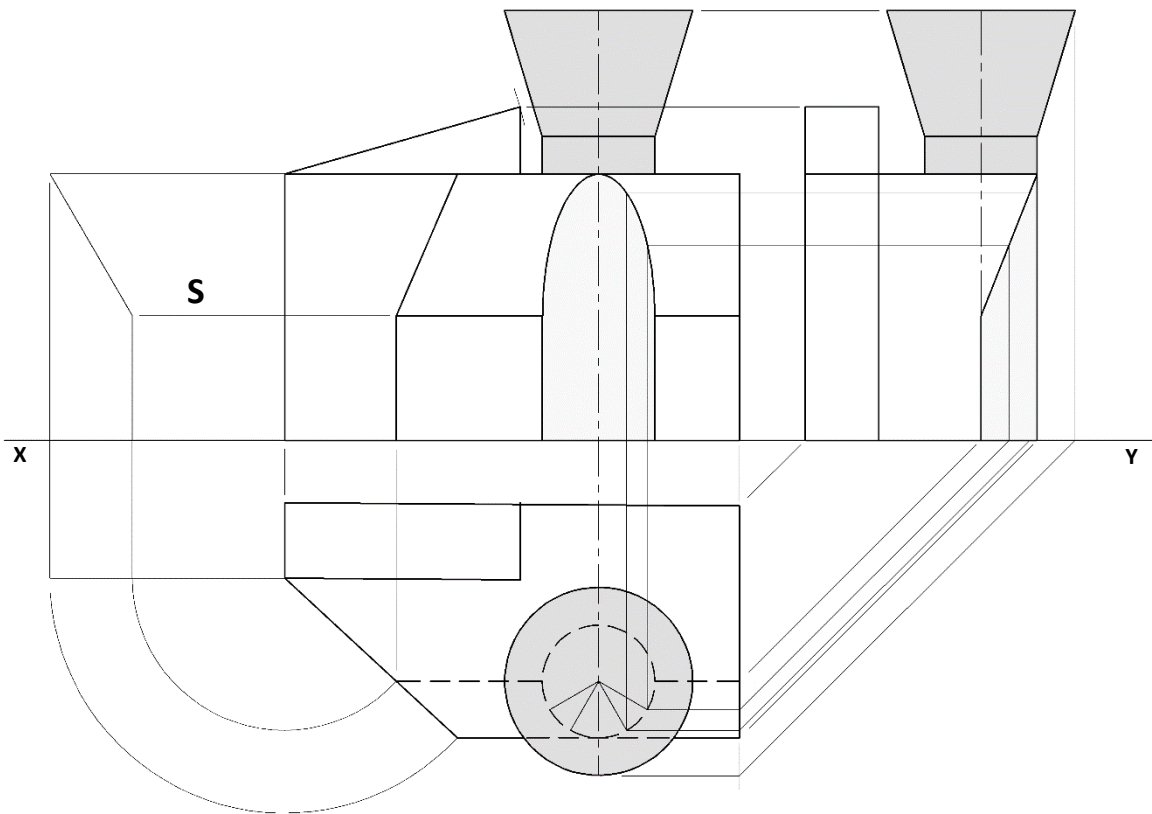
| | | |
|------------|----|--------------------------------------|
| Q13 | | |
| | 12 | Six Points of Contact - 2 marks each |

| | | |
|------------|---|---|
| Q14 | | |
| | 6 | Camera outline: body (4), flash (2) |
| | 6 | Complete elevation: button (2), centre (2), lense (2) |

| | | |
|------------|---|-----------------|
| Q15 | | |
| | 8 | Four sectors |
| | 4 | Colour or Shade |

Section B – any four questions from this section

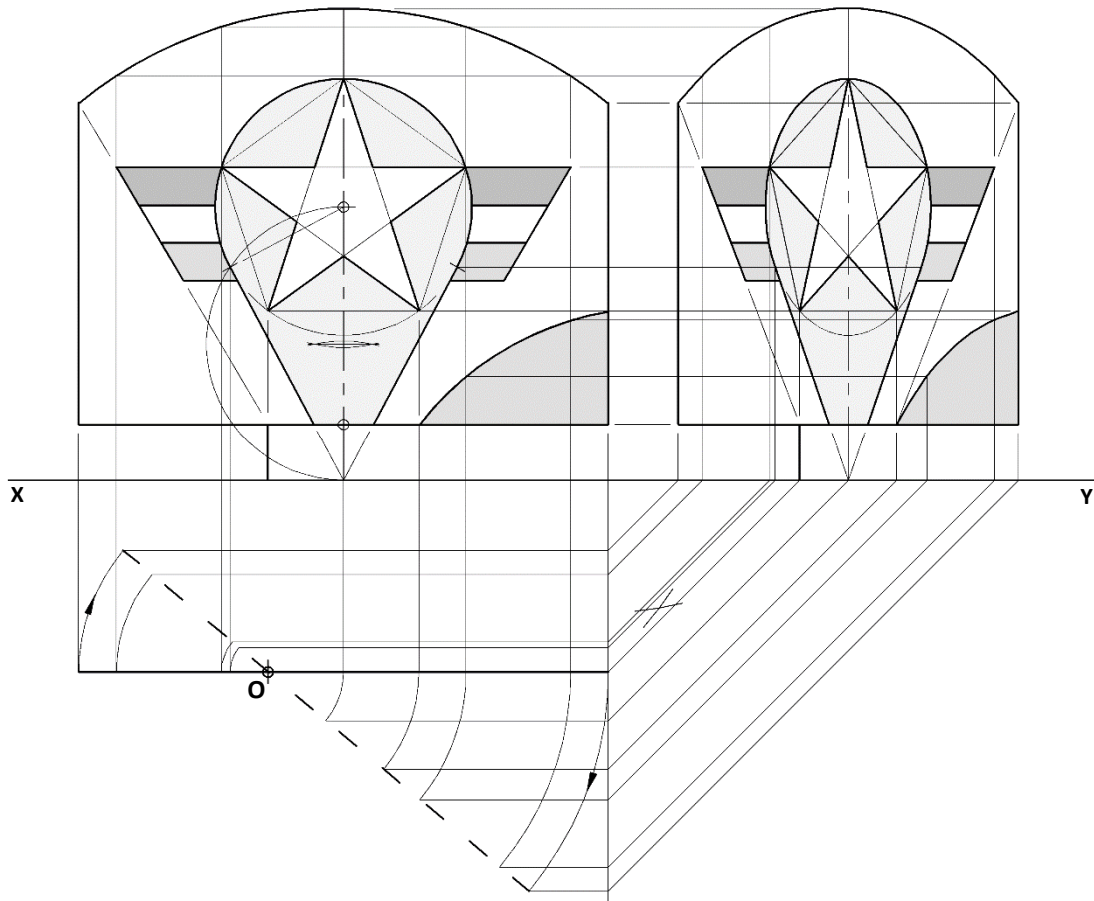
Q.1 – Orthographic projection.



| Elevation (24) | | |
|----------------|--|--|
| 5 | Building outline | |
| 4 | Determine surface S | |
| 6 | Tower | |
| 6 | Elliptical curve: Points in plan, project to end-elev, project to elev, draw (1,1,2,2) | |
| 3 | Roof | |
| Plan (13) | | |
| 5 | Building outline | |
| 4 | Circular tower | |
| 2 | Roof | |
| 2 | Hidden detail | |
| End View (15) | | |
| 6 | Building outline | |
| 6 | Tower | |
| 3 | Roof | |
| True Shape (8) | | |
| 8 | Rotation Method | Auxiliary Method |
| | Project from plan (3), project heights (2), completion (3) | New XY lines (3), transfer heights (2), completion (3) |
| 10 | Drafting, accuracy, presentation | |

Total Marks 70

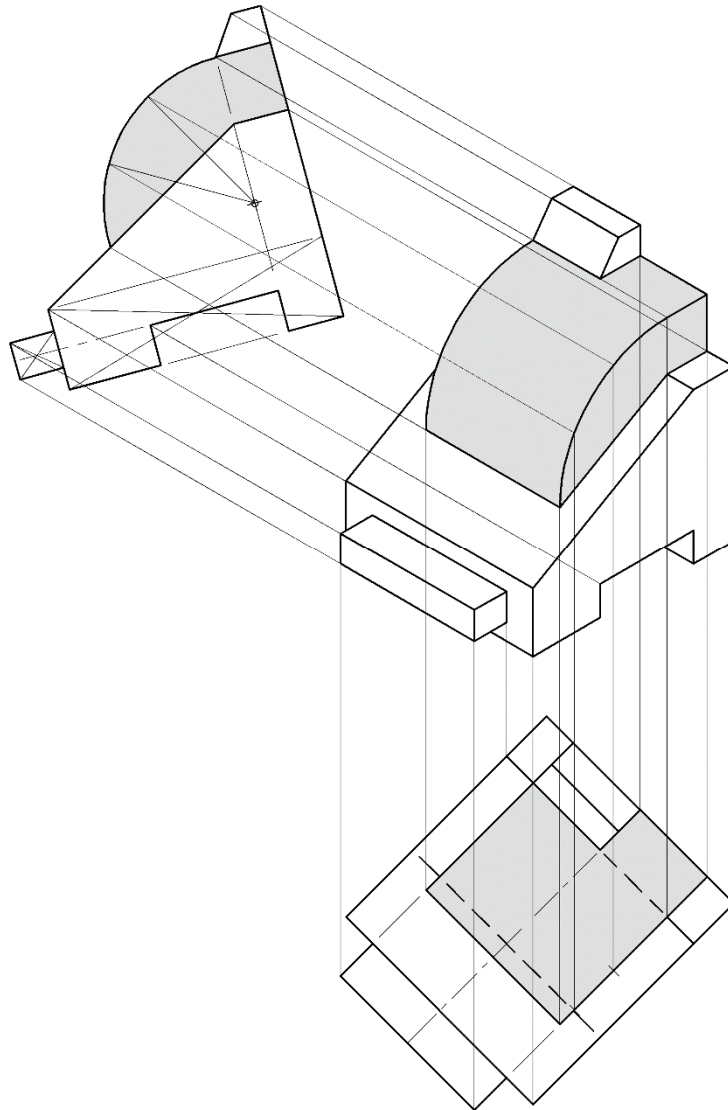
Q.2 - Orthographic, Rotation, End Elevation.



| Given Elevation (22) | |
|-----------------------------|---|
| 5 | Outline: lines (4), arc (1) |
| 10 | Logo: pentagonal star (5), circle (1), tangent construction (2), tangents (2) |
| 4 | Logo strips |
| 3 | R80 arc: locate centre (2), draw (1) |
| Given Plan (6) | |
| 2 | Horizontal line |
| 4 | 40° angle (2), correct length (2) |
| 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 |
| 7 | Outline: lines (4), curve (3) |
| 10 | Logo: pentagonal star (3), curve (5), tangents (2) |
| 4 | Logo strips |
| 3 | Arc |
| 10 | Drafting, accuracy, presentation |

Total Marks 70

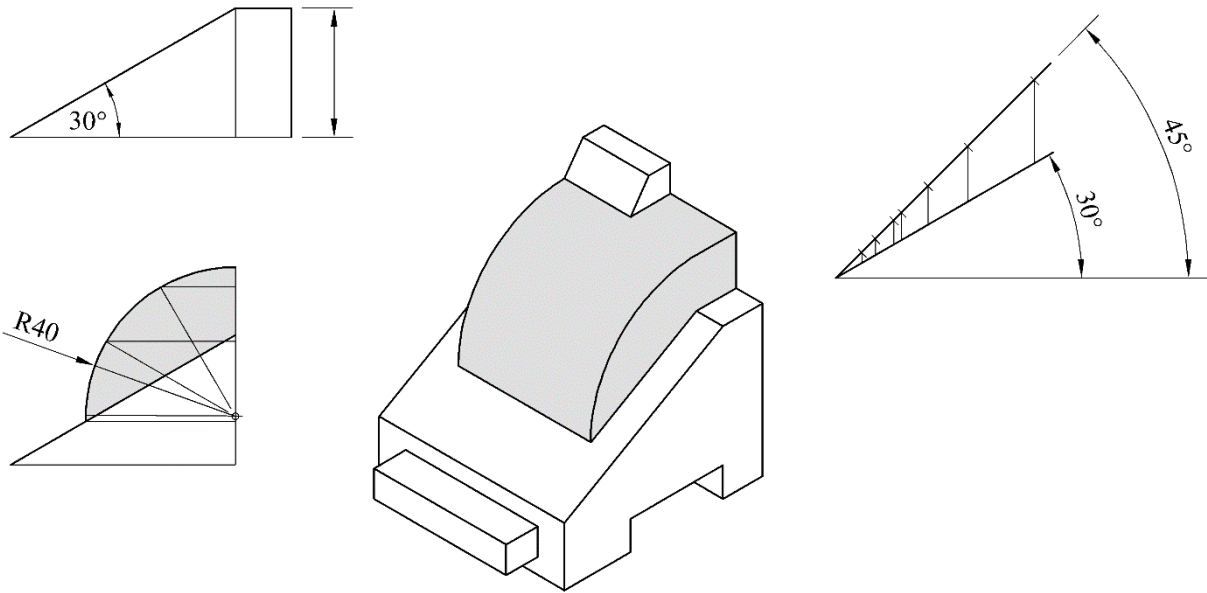
Q.3 (a) - Isometric Projection (Axonometric Axes Method)



| Axonometric Axes Method | |
|--|---|
| Elevation (13) | |
| 7 | Body outline – 9 lines |
| 2 | Drawer |
| 4 | Register top |
| Plan (13) | |
| 5 | Body outline |
| 2 | Drawer |
| 4 | Register top |
| 2 | Hidden detail |
| Completion of Isometric Projection (34) | |
| 10 | Body outline |
| 6 | Drawer |
| 12 | Register top curve body: curves (4,2), surfaces (6) |
| 6 | Register top |
| 10 | Drafting, accuracy, presentation |

Total Marks 70

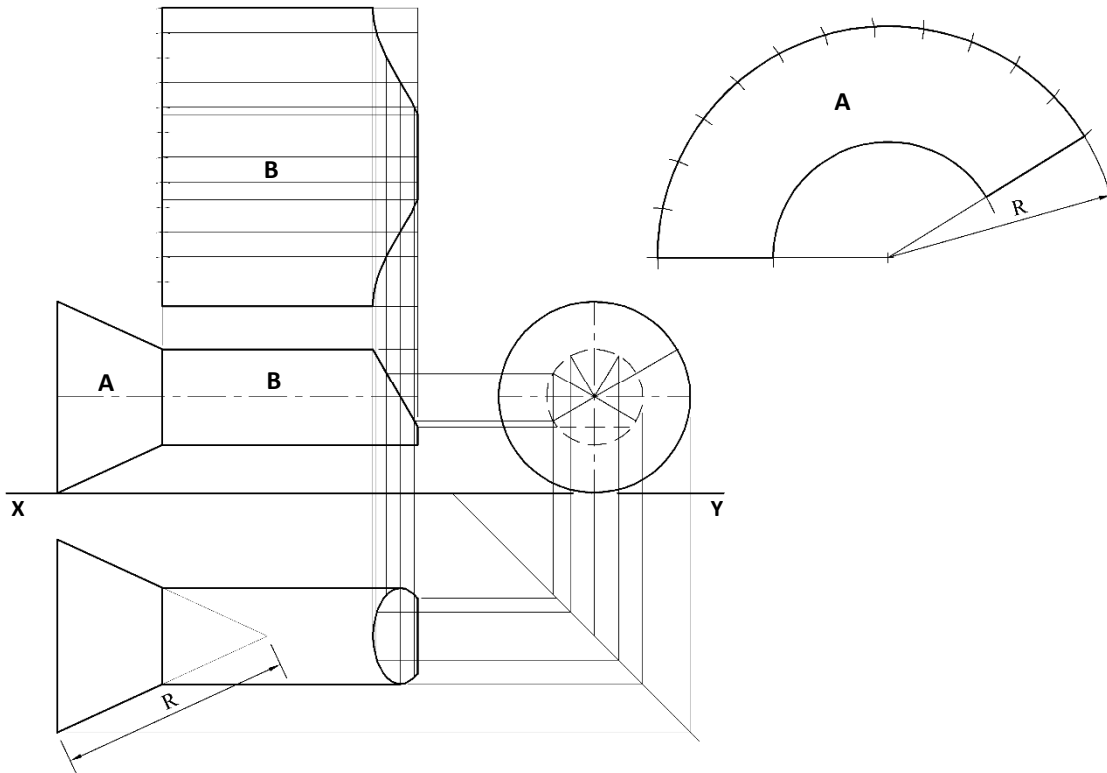
Q.3 (b) - Isometric Projection (Isometric Scale Method)



| Isometric Scale Method | |
|--|--|
| Isometric Scale (9) | |
| 4 | Setting up isometric scale (2 marks for 30 ^o line and 2 marks for 45 ^o line) |
| 3 | Applying dimensions on 45 ^o line |
| 2 | Projecting from 45 ^o line onto 30 ^o line |
| Construction of register (11) | |
| 3 | Apply measurements required for Register |
| 8 | Constructions required for register (3,5) |
| Isometric Projection (6) | |
| 6 | Direction of axes (2,2,2) |
| Completion of Isometric Projection (34) | |
| 10 | Body outline |
| 6 | Drawer |
| 12 | Register top curve body: curves (4,2), surfaces (6) |
| 6 | Register top |
| 10 | Drafting, accuracy, presentation |

Total Marks 70

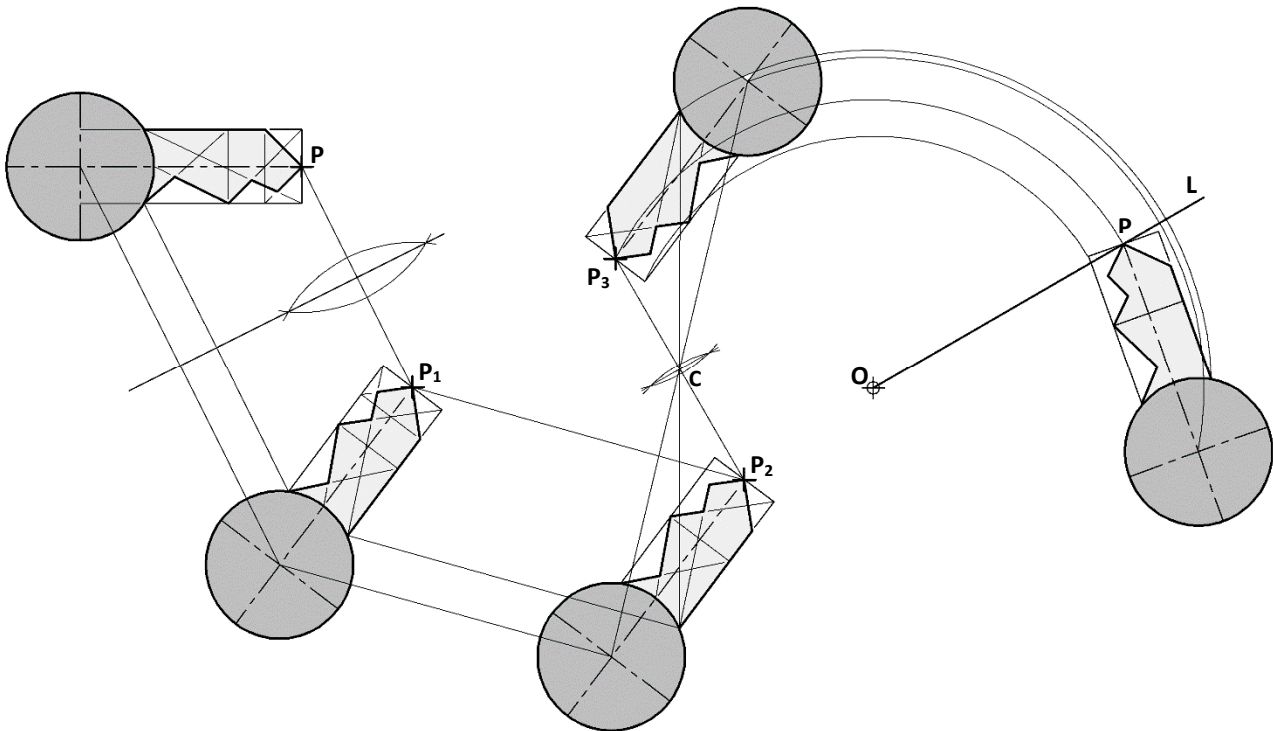
Q.4 - Development



| Elevation (8) | |
|--------------------------------------|--|
| 5 | Truncated cylinder handle |
| 3 | Torch head |
| End View (5) | |
| 4 | Circles: $\varnothing 64$ (2), $\varnothing 32$ (2) |
| 1 | Line |
| Plan (13) | |
| 4 | Truncated cylinder handle |
| 3 | Torch head |
| 6 | Elliptical curve: Points in EV, project to elev, project to plan, draw (1,1,2,2) |
| Development of surface A (14) | |
| 2 | True length of edge |
| 2 | Swing arc of correct extreme generator |
| 4 | Stepping out length of curve: correct increment (2), correct number (2) |
| 2 | Swing arc equal to true length of truncation |
| 4 | Drawing the required development |
| Development of surface B (20) | |
| 4 | Stepping out length of development (2 correct increment, 2 correct No.) |
| 4 | Projecting lengths |
| 6 | Locating points (4), truncation positions (2) |
| 6 | Drawing the required development |
| 10 | Drafting, accuracy, presentation |

Total Marks 70

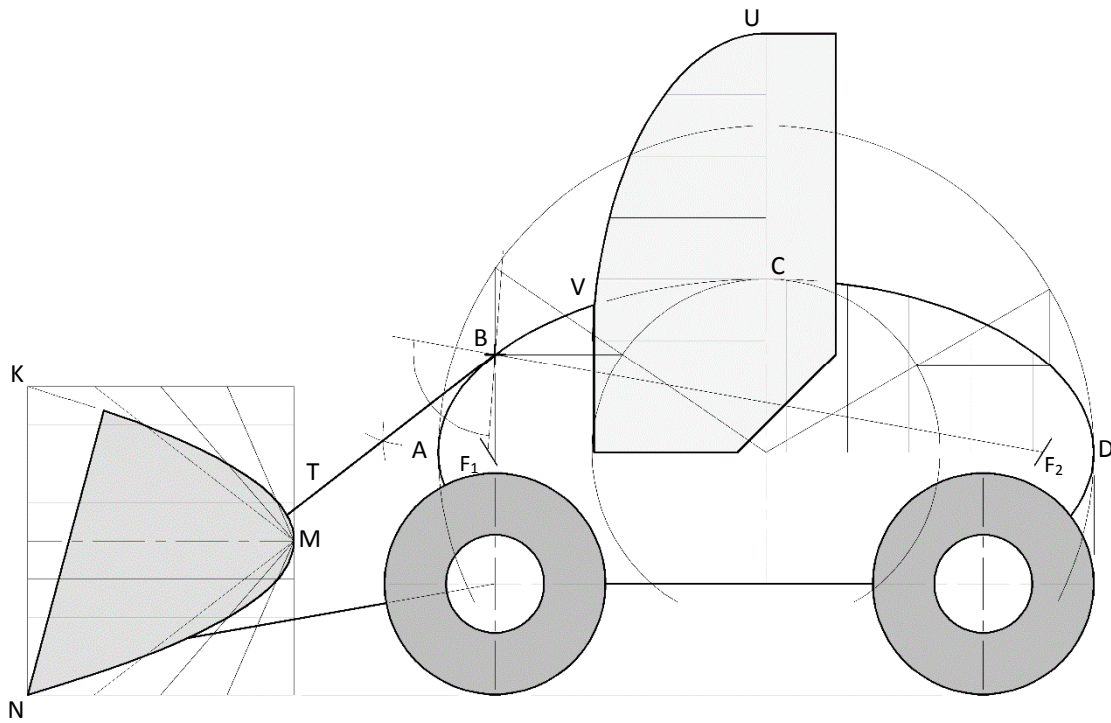
Q.5 - Transformation Geometry



| Setting up (8) | |
|------------------------------|--|
| 4 | Key logo outline: R20 Circle (2), body outline (2) |
| 4 | Complete logo |
| 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 $P_1 - P_2$ |
| 4 | Locating key image points |
| 4 | Drawing the image figure accurately |
| Central Symmetry (12) | |
| 4 | Locate pt C (2), project lines through C (2) |
| 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) | |
|------------------------------|---|
| 2 | Draw major circle |
| 8 | Identify (6) and draw minor circle (2) |
| 6 | Locating additional points on the curve (2, 2, 2) |
| 4 | Drawing the curve |
| Parabolic bucket (14) | |
| 8 | Construction to determine points on the parabola (2,2,2,2) |
| 4 | Drawing of parabola KMN |
| 2 | 75° line |
| Cab (12) | |
| 1 | Draw ordinate 60mm from pt C |
| 4 | Identify vertical and horizontal distances for three points (2,2) |
| 2 | Draw the curve UV |
| 5 | 5 lines on cab |
| Tangent (8) | |
| 2 | Locate focal points |
| 4 | Join F₁BF₂ (2), Bisecting angle F₁BF₂ (2) |
| 2 | Draw tangent BT |
| Completion (6) | |
| 4 | Wheels (2, 2) |
| 2 | Lines: 10° line (1), base line (1) |
| 10 | Drafting, accuracy, presentation |

Total Marks 70