



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2004

Technical Drawing

Paper 1 Ordinary Level

Marking Scheme & Sample Solutions

(Other valid solutions are acceptable and marked accordingly)

Question 1

| | | <u>Marks</u> | |
|--------------------|---------------------------------------|--------------|-----------|
| (a) | Elevation | 10 | |
| | 1. Outline elevation | | 2 |
| | 2. Locate point b..... | | 3 |
| | 3. Complete elevation | | 5 |
| (b) | Plan | 12 | |
| | 4. Outline plan | | 2 |
| | 5. Plan of surface A | | 2 |
| | 6. Width of surface E in plan..... | | 6 |
| | 7. Complete plan | | 2 |
| (c) | New Elevation | 23 | |
| | 8. X1Y1 parallel to plan of A | | 2 |
| | 9. Projections from plan | | 2 |
| | 10. Heights from elevation (2x2)..... | | 4 |
| | 11. Surface A | | 7 |
| | 12. Complete new elevation | | 8 |
| | 13. <i>Presentation</i> | 5 | 5 |
| Total | | | 50 |

Question 2

Marks

| | | |
|--------------------------------------|-----------|-----------|
| (a) Triangle ABC | 18 | |
| 1. Draw line AC 127 long | | 6 |
| 2. Geometrical division of AC | | 6 |
| 3. Locate point B | | 2 |
| 4. Complete triangle ABC | | 4 |
| | | |
| Point D | 12 | |
| 5. Mark altitude | | 4 |
| 6. Locate point D | | 4 |
| 7. Draw lines AD and CD | | 4 |
| | | |
| (b) Area Conversion | 15 | |
| 8. Quadrilateral to a triangle | | 4 |
| 9. Triangle to a rectangle | | 3 |
| 10. Rectangle to a square | | 4 |
| 11. Draw square | | 4 |
| | | |
| 12. <i>Presentation</i> | 5 | 5 |
| | | |
| Total | | 50 |

Question 3

Marks

| | | |
|---|-----------|-----------|
| (a) Elevation | 9 | |
| 1. Draw cone A, sphere B | | 6 |
| 2. Draw sphere C | | 3 |
| Plan | 18 | |
| 3. Given cone inc. point P (3, 1) | | 4 |
| 4. Given sphere B | | 3 |
| Sphere C | | |
| 5. Points r and s in elevation | | 4 |
| 6. Locating point t | | 4 |
| 7. Draw sphere | | 3 |
| (b) Point P in elevation | 5 | |
| 8. Altitude or correct generator | | 2 |
| 9. Projection from plan | | 2 |
| 10. Locate point P | | 1 |
| (c) Sphere D | 13 | |
| 11. Locating point u | | 2 |
| 12. Locating point O2 | | 3 |
| 13. Locating point O | | 2 |
| 14. Locating point O1 | | 2 |
| 15. Draw spheres | | 4 |
| 16. <i>Presentation</i> | 5 | 5 |
| Total | | 50 |

Question 4

| | | <u>Marks</u> |
|------------------------|--|---------------|
| Given Views | | 14 |
| 1. | Given plan (3, 3) | 6 |
| 2. | Given elevation (4, 4) | 8 |
| Envelopment | | 31 |
| 3. | Division of circle | 4 |
| 4. | Project divisions to elevation | 4 |
| 5. | Surface development (appropriate subdivisions) | 7 |
| 6. | Points a,b and c on the cylinder | 3 |
| 7. | Projections from surface dev. to cyl. | 3 |
| 8. | Intermediate points on ac and bc in elevation | 4 |
| 9. | Locate points from arc, in elevation | 3 |
| 10. | Draw curves in elevation (3x1) | 3 |
| 11. | <i>Presentation</i> 5 | 5 |
| Total | | 50 |

Question 5

| | | <u>Marks</u> |
|----------------|--|---------------|
| (a) | Setting up | 9 |
| | 1. Given plan | 4 |
| | 2. Given elevation | 3 |
| | 3. Traces VTH | 2 |
| | Auxiliary Elevation | 9 |
| | 4. X1Y1 perp. to H.T. | 2 |
| | 5. Projections from plan | 2 |
| | 6. Edge view of plane | 2 |
| | 7. Auxiliary view of solid | 3 |
| | Truncation | 20 |
| | 8. Points bcdef in plan | 7 |
| | 9. Points abcdef in elevation | 9 |
| | 10. Complete plan | 2 |
| | 11. Complete elevation | 2 |
| (b) | True Shape | 7 |
| | 12. Setting up true lengths and widths | 4 |
| | 13. Draw true shape | 3 |
| | 14. <i>Presentation</i> | 5 |
| | Total | 50 |

Question 6

Marks

| | | |
|--|-----------|-----------|
| (a) Ellipse | 18 | |
| 1. Setting up major and minor axes | | 6 |
| 2. Points on the curve | | 8 |
| 3. Draw curve | | 4 |
| Tangent | 13 | |
| 4. Locate point P | | 1 |
| 5. Locate the foci points | | 4 |
| 6. Tangent construction | | 4 |
| 7. Draw tangent | | 4 |
| (b) Hyperbola | 14 | |
| 8. Set up as given | | 3 |
| 9. Locate focus | | 4 |
| 10. Points on curve | | 5 |
| 11. Draw curve | | 2 |
| 12. <i>Presentation</i> | 5 | 5 |
| Total | | 50 |

Question 7**Marks****Setting up****20**

- | | | |
|----|-----------------------|----------|
| 1. | Given plan | 5 |
| 2. | Given elevation | 6 |
| 3. | End elevation | 9 |

Interpenetration**25**

- | | | |
|----|---|----------|
| 4. | Projections from LHS of elevation | 4 |
| 5. | Locate points in plan | 6 |
| 6. | Complete LHS of plan | 3 |
| 7. | Projections from RHS of plan, end elevation | 4 |
| 8. | Locate points on elevation | 4 |
| 9. | Complete RHS of elevation | 4 |

- | | | | | |
|-----|---------------------|----------|-------|----------|
| 10. | <i>Presentation</i> | 5 | | 5 |
|-----|---------------------|----------|-------|----------|

Total **50**

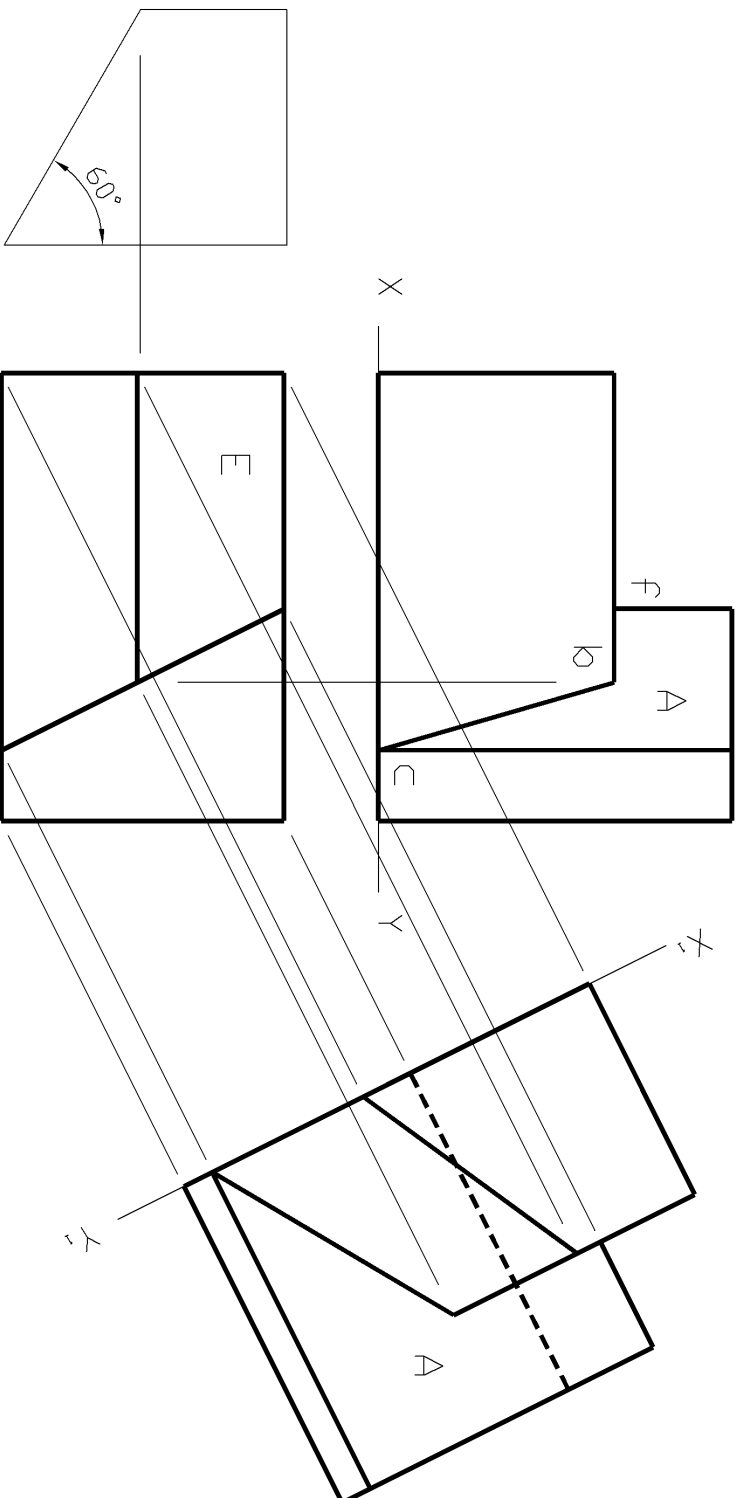


Fig. 1

| | |
|------------------------|------|
| TECHNICAL DRAWING | |
| PAPER 1 ORDINARY LEVEL | |
| QUESTION 1 | 2004 |
| SCALE: N/A | |

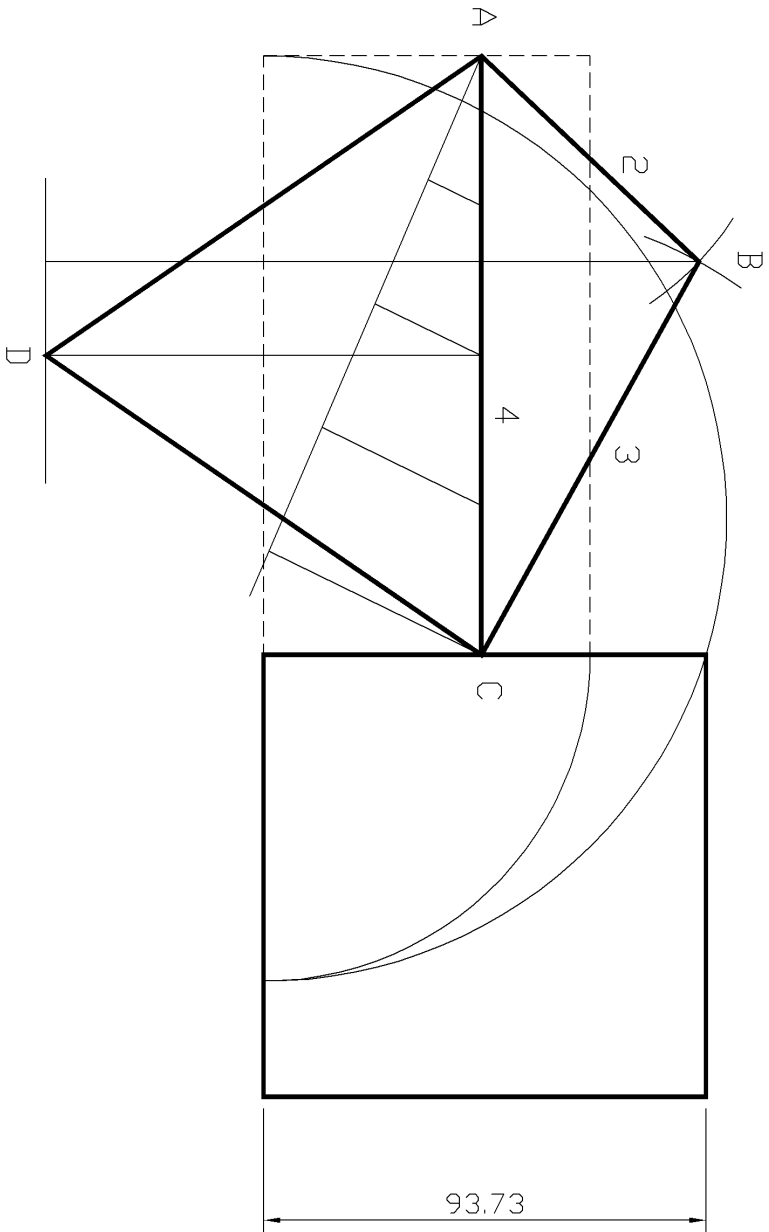


Fig. 2

TECHNICAL DRAWING
PAPER 1 ORDINARY LEVEL

QUESTION 2

2004

SCALE: N/A

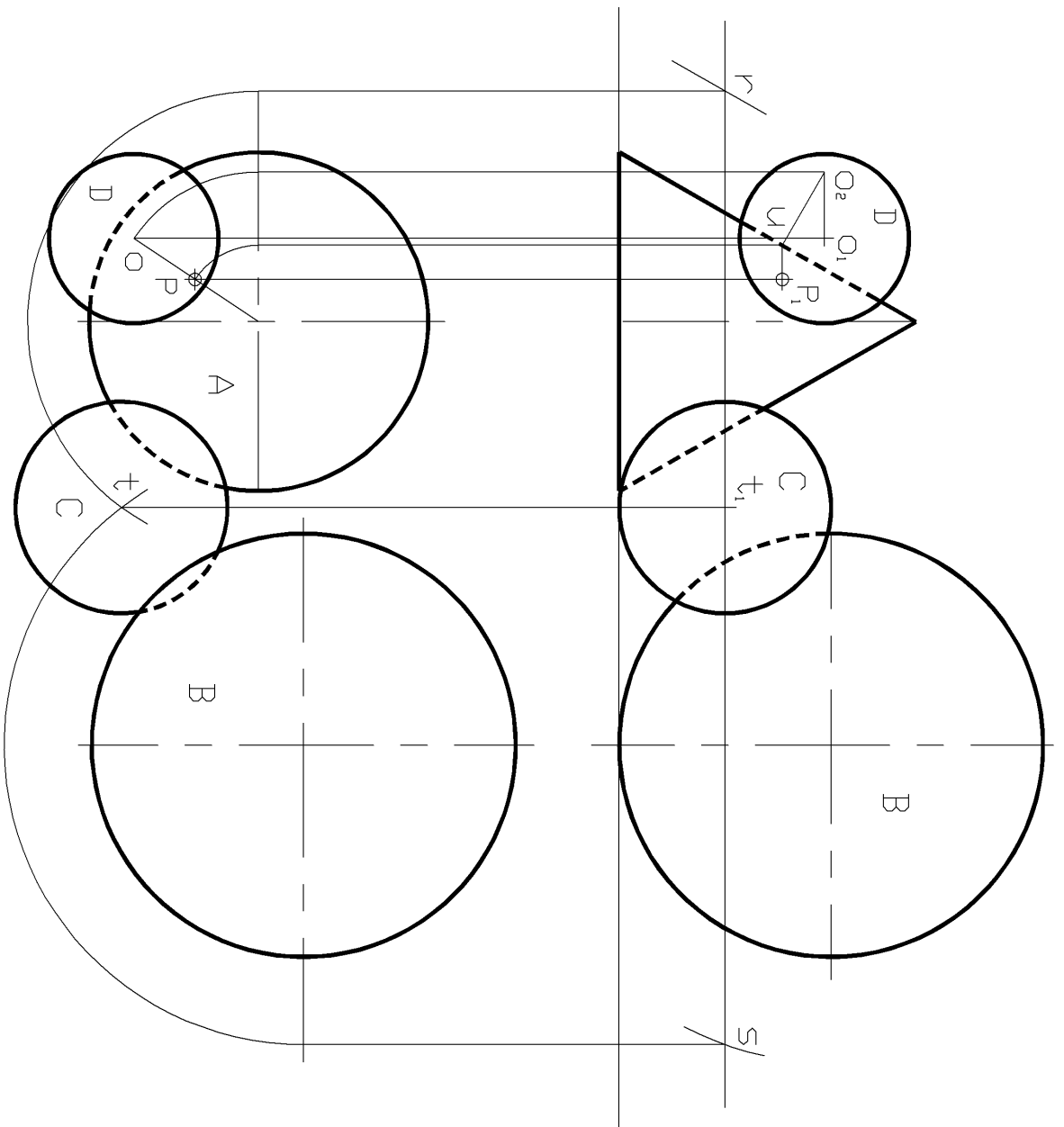


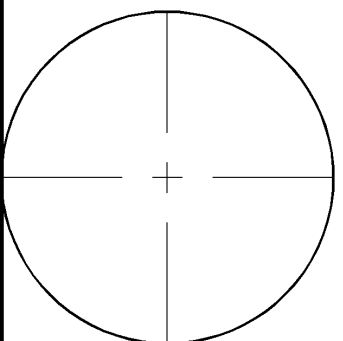
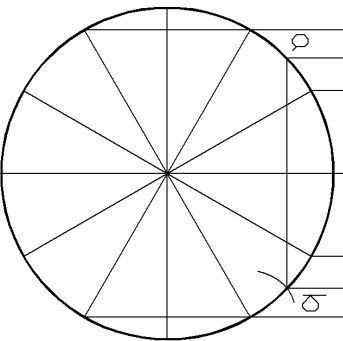
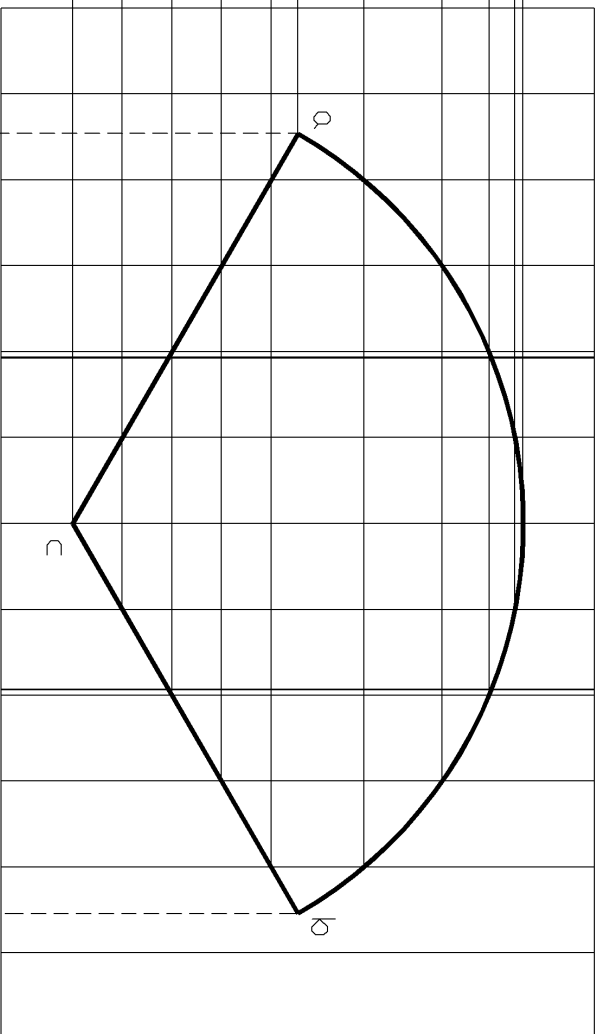
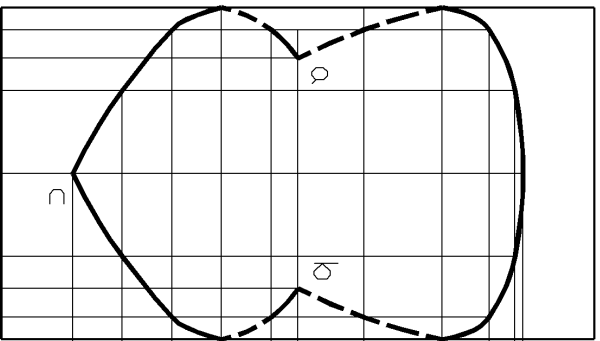
Fig. 3

TECHNICAL DRAWING
PAPER 1 ORDINARY LEVEL

QUESTION 3

2004

SCALE: N/A



Solution is drawn seperately
for clarity

Fig. 4

| | |
|------------------------|------|
| TECHNICAL DRAWING | |
| PAPER 1 ORDINARY LEVEL | |
| QUESTION 4 | 2004 |
| SCALE: N/A | |

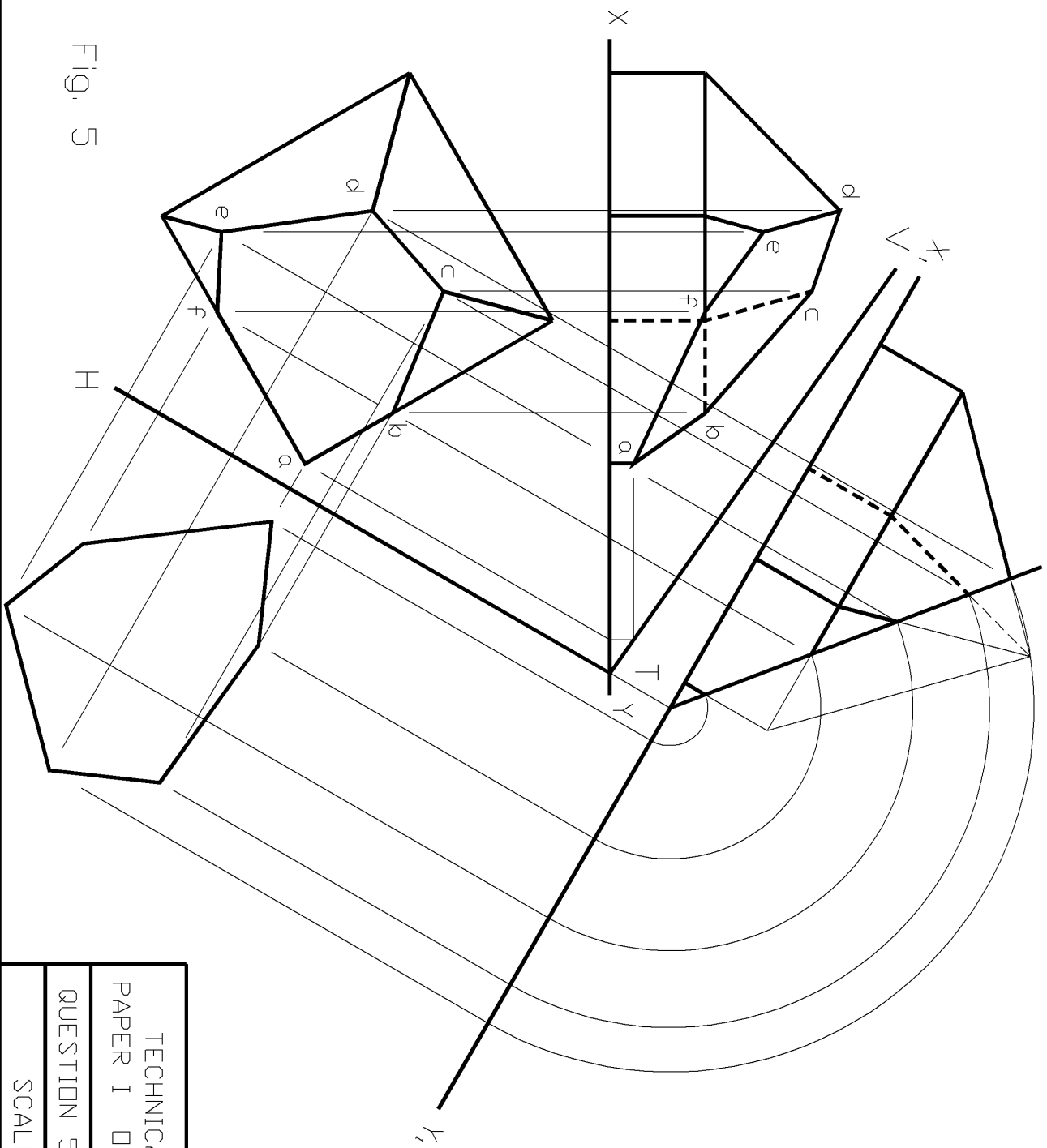


Fig. 5

| | |
|------------------------|------|
| TECHNICAL DRAWING | |
| PAPER I ORDINARY LEVEL | |
| QUESTION 5 | 2004 |
| SCALE: N/A | |

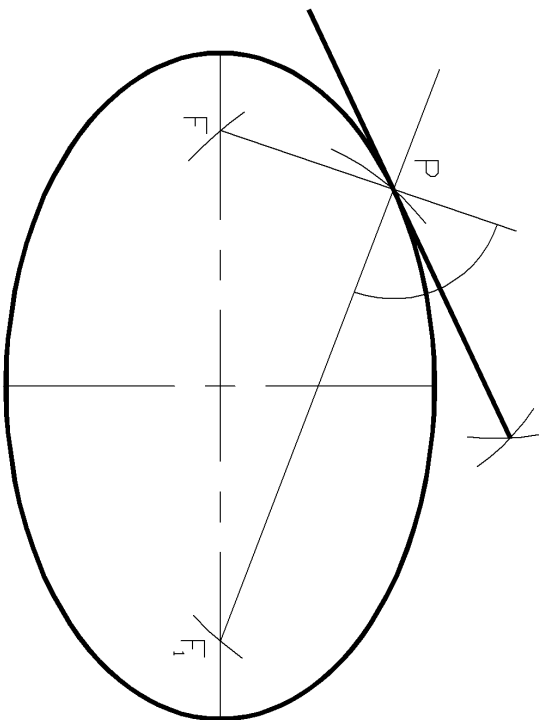


Fig. 6a

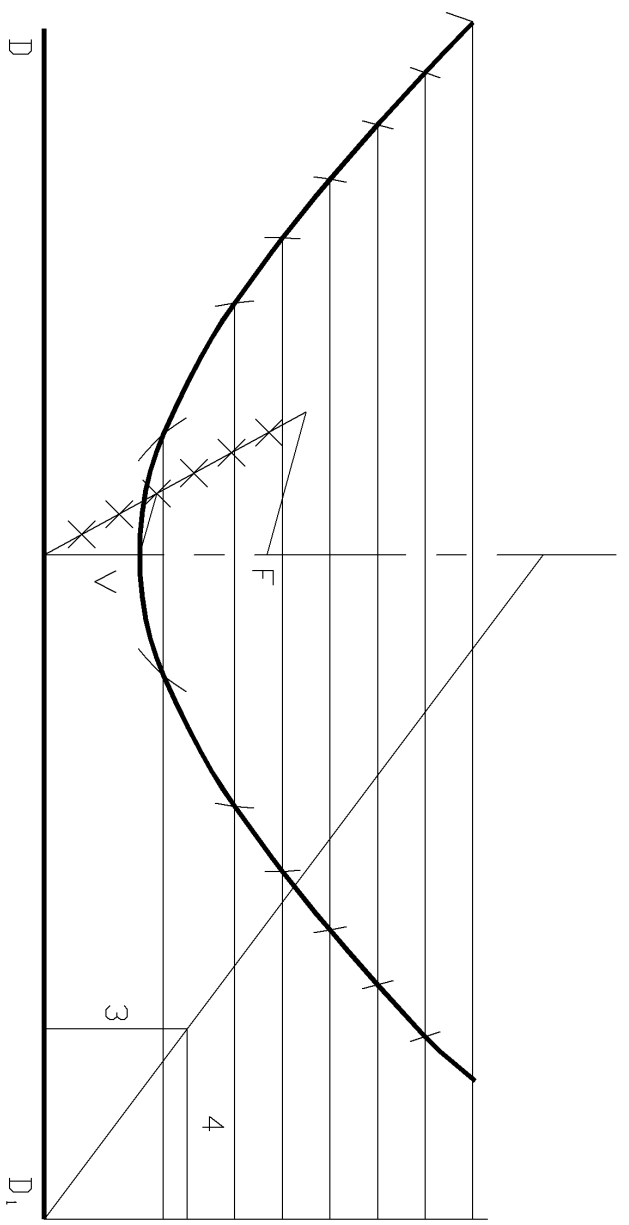


Fig. 6b

| | |
|------------------------|------|
| TECHNICAL DRAWING | |
| PAPER 1 ORDINARY LEVEL | |
| QUESTION 6 | 2004 |
| SCALE: N/A | |

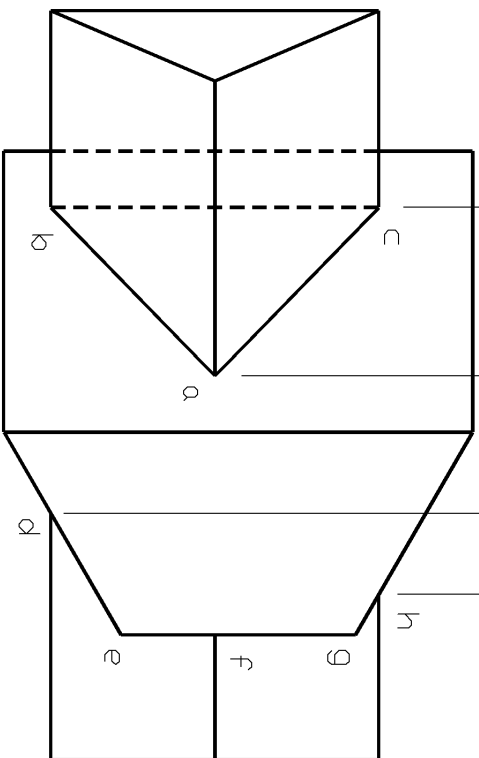
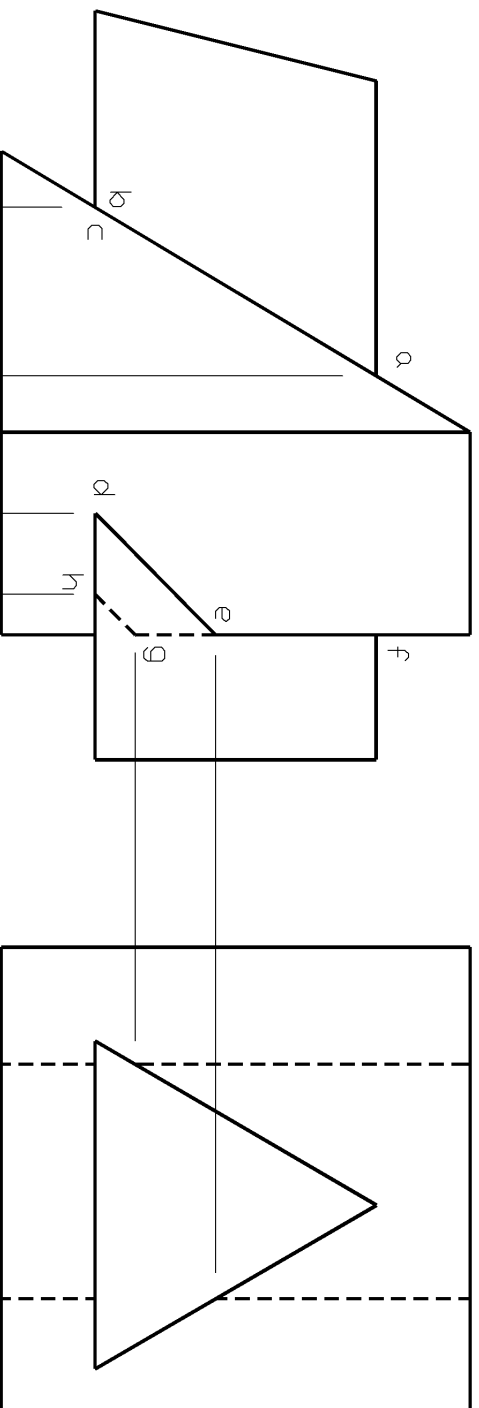


Fig. 7

TECHNICAL DRAWING
PAPER 1 ORDINARY LEVEL

QUESTION 7

2004

SCALE: N/A



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2004

Technical Drawing

Paper 2A
(Engineering Applications)

Ordinary Level

Marking Scheme & Sample Solutions

(Other valid solutions are acceptable and marked accordingly)

QUESTION 1

(100 Marks)

CONCEPTS

| | | |
|----------|--------------------------------|-----------------|
| A | Assembly | 4 Marks |
| B | Sectional Elevation | 38 Marks |
| C | Plan | 32 Marks |
| D | Additional Requirements | 26 Marks |

1A ASSEMBLY 4 Marks

| | | |
|-------|-----------------------|---|
| (i) | End Plate to Body | 1 |
| (ii) | Fixing Screws to Body | 1 |
| (iii) | Bar to Vice | 1 |
| (iv) | Screw to End Plate | 1 |

1B SECTIONAL ELEVATION 38 Marks

1. Body 8 Marks

| | | |
|-------|-----------------|---|
| (i) | Web | 2 |
| (ii) | Angle Jaw | 2 |
| (iii) | Arc | 2 |
| (iv) | Main Lower Body | 2 |

2. End Plate 8 Marks

| | | |
|-------|-------------|---|
| (i) | Lower Body | 2 |
| (ii) | Arc | 2 |
| (iii) | Below Screw | 2 |
| (iv) | Above Screw | 2 |

3. Clamp Screw 18 Marks

| | | |
|--------|-------------------------|---|
| (i) | Spud | 2 |
| (ii) | Screw Thread Length | 2 |
| (iii) | Screw Thread Diameter | 2 |
| (iv) | Screw Thread Convention | 2 |
| (v) | Undercut | 2 |
| (vi) | Depth of Head | 2 |
| (vii) | Number of Faces | 2 |
| (viii) | Hex Construction | 2 |
| (ix) | Curves | 2 |

4. Bar 2 Marks

5. Centre Lines 2 Marks

No. 3

1C PLAN**32 Marks****1. Body**

8 Marks

- (i) Web 2
- (ii) Outside Web 2
- (iii) Top of Angle Jaw 2
- (iv) Top of Base 2

2. End Plate

4 Marks

- (i) Small Rectangle 2
- (ii) Large Rectangle 2

3. Clamp Screw

16 Marks

- (i) Spud 2
- (ii) Left Hand Screw 2
- (iii) Right Hand Screw 2
- (iv) Thread Convention 2
- (v) Under Cut 2
- (vi) Head Depth 2
- (vii) No. of Faces 2
- (viii) Curves 2

4. Bar

2

2 Marks

5. Centre Lines

2 Marks

No. 2 X 1 each

1D ADDITIONAL REQUIREMENTS**26 Marks**

- (i) First or Third Angle Projection

4 Marks

- (ii) Title

4 Marks

- (a) Form 1
- (b) Width and Height 1
- (c) Spacing 1
- (d) Appearance 1

- (iii) ISO Symbol

4 Marks

(Correct 4 Marks)
(Incorrect 2 Marks)

- (iv) Dimensioning

4 Marks

- (a) Projection Lines 1
- (b) Dimension Lines 1
- (c) Arrow Heads 1
- (d) Figures 1

- (v) Presentation

10 Marks

- Excellent 10
- Very Good 8
- Good 6
- Fair 4
- Poor 2

QUESTION 2**(50 Marks)**

| | | |
|----------|----------------------------|-----------------|
| A | Given View | 8 Marks |
| B | Plan View | 16 Marks |
| C | Surface Development | 14 Marks |
| D | Joint | 8 Marks |
| E | Presentation | 4 Marks |

2A GIVEN VIEW 8 Marks

| | | |
|-------|-----------------------|---|
| (i) | Top Pipe Outline | 2 |
| (ii) | Pipe B Outline | 2 |
| (iii) | Bottom Pipe Outline | 2 |
| (iv) | Lines of Intersection | 2 |

2B PLAN VIEW 16 Marks

| | | |
|-------|-----------------------------------|---|
| (i) | Division of Cylinder in Elevation | 2 |
| (ii) | Division of Cylinder in Plan | 2 |
| (iii) | Projection of Generators | |
| | (a) From elevation | 2 |
| | (b) Across plan | 2 |
| (iv) | Top Ellipse | 2 |
| (v) | Middle Half Ellipse | 2 |
| (vi) | Bottom Half Ellipse | 2 |
| (vii) | Plan Outline | 2 |

2C SURFACE DEVELOPMENT PIPE B 14 Marks

| | | |
|-------|----------------------------------|---|
| (i) | Projection of Circumference | 2 |
| (ii) | Division of Circumference | 2 |
| (iii) | Drawing of Generators | 2 |
| (iv) | Projection of Top of Cylinder | 2 |
| (v) | Projection of Bottom of Cylinder | 2 |
| (vi) | Drawing of Curves | 2 |
| (vii) | Seam on SS | 2 |

2D JOINT 8 Marks

| | | |
|-------|----------------|---|
| (i) | Grooved Seam | 2 |
| (ii) | Left Hand Lap | 2 |
| (iii) | Right Hand Lap | 2 |
| (iv) | Sketch | 2 |

2E PRESENTATION 4 Marks

| | | |
|--|-----------|---|
| | Excellent | 4 |
| | Very Good | 3 |
| | Good | 2 |
| | Fair | 1 |

Note: Indexing to be considered under this heading

QUESTION 3**(50 Marks)****3A Cam Profile****30 Marks****3B Mechanism****20 Marks****3A Cam Profile****30 Marks**

- (a) Cam Profile
- (b) Displacement Diagram
- (c) Presentation

15 Marks

10 Marks

5 Marks

(a) Cam Profile**15 Marks**

- | | | |
|--|---|---|
| (i) Minimum Radius | 1 | |
| (ii) Maximum Radius | 1 | |
| (iii) Graduation Divisions | 1 | |
| (iv) 0° to 180° Uniform Acc. & Ret. | | 3 |
| (v) 180° to 270° Dwell | 2 | |
| (vi) 270° to 360° Simple Harmonic Motion | 3 | |
| (vii) Direction of Rotation | 2 | |
| (viii) Drawing of Profile | 2 | |

(b) Displacement Diagram**10 Marks**

- | | | |
|---|---|---|
| (i) 360° Divisions | 2 | |
| (ii) Lift/Travel | 1 | |
| (iii) 0° to 180° Uniform Acc. & Ret. | | 2 |
| (iv) 180° to 270° Dwell | 1 | |
| (v) 270° to 360° Simple Harmonic Motion | 2 | |
| (vi) Drawing of Curve | 2 | |

(c) Presentation**5 Marks**

- | | |
|-----------|---|
| Excellent | 5 |
| Very Good | 4 |
| Good | 3 |
| Fair | 2 |
| Poor | 1 |

Note: Indexing to be considered under this heading

3B Mechanism

20 Marks

- | | | |
|-----|---------------|----------|
| (a) | Line Diagram | 4 Marks |
| (b) | Locus of F | 12 Marks |
| (c) | Machine Guard | 4 Marks |

(a) Line Diagram

4 Marks

- | | | |
|-------|----------|---|
| (i) | Crank AB | 1 |
| (ii) | Crank CD | 1 |
| (iii) | Link BF | 1 |
| (iv) | Link DE | 1 |

(b) Locus of F

12 Marks

- | | | |
|-------|-----------------------------|---|
| (i) | Locus of B | 2 |
| (ii) | Locus of D | 2 |
| (iii) | Plotting Locus Points for E | 2 |
| (iv) | Drawing Locus E | 2 |
| (v) | Plotting Points for F | 2 |
| (vi) | Drawing Locus of F | 2 |

(c) Machine Guard

4 Marks

- | | | |
|------|-------------------|---|
| (i) | Minimum Clearance | 1 |
| (ii) | Drawing of Guard | 3 |
| | Excellent | 3 |
| | Good | 2 |
| | Fair | 1 |

QUESTION 4

(50 Marks)

4A Dimensional Drawing

35 Marks

4B Machine Part

9 Marks

4C Engineering Terms

6 Marks

4A Dimensional Drawing

35 Marks

(a) Shape Description

18 Marks

(b) Size Description

14 Marks

(c) Presentation

3 Marks

(a) Shape Description

18 Marks

| | |
|----------------------------|---|
| (i) Square Shaft (X) | 2 |
| (ii) Thread Convention | 2 |
| (iii) Diam./Length | 2 |
| (iv) Shaft Diameter/Length | 2 |
| (v) Taper Max Diam. | 1 |
| (vi) Taper Min Diam. | 1 |
| (vii) Keyway Slot | 2 |
| (viii) Dropped Edge | 2 |
| (ix) Under Cut | 1 |
| (x) Thread Convention | 1 |
| (xi) Diam./Length | 1 |
| (xii) Dome | 1 |

(b) Size Description

14 Marks

| | |
|--------------------------------|---|
| (i) Diameters x 3 | 1 |
| (ii) Lengths x 6 | 2 |
| (iii) Square Dimension | 2 |
| (iv) Keyway Diameter | 2 |
| (v) Keyway Depth | 2 |
| (vi) Under Cut Dimension | 2 |
| (vii) Screw Thread Designation | 3 |
| (a) Metric | 1 |
| (b) Nominal Diam. | 1 |
| (c) Pitch | 1 |

(c) Presentation

3 Marks

| | |
|------------------|---|
| (i) Centre Lines | 1 |
| (ii) Dimensions | 2 |

4B Machine Part

9 Marks

| | |
|------------------------|---|
| (i) Screw Down Valve | 2 |
| (ii) Part 1 Hand Wheel | 1 |
| Part 2 Packing | 1 |
| Part 3 Valve Seat | 1 |
| Part 4 Stud | 1 |
| Part 5 Stem | 1 |
| (iii) Methods | |
| (a) Name | 1 |
| (b) Sketch | 1 |

4C Engineering Terms

6 Marks

- | | | |
|-------|--------|---|
| (i) | Keyway | 2 |
| (ii) | Collar | 2 |
| (iii) | Dowel | 2 |

QUESTION 5**SECTION A****(50 Marks)****5A Isometric View****38 Marks****5B Bearings****12 Marks****5A Isometric View****38 Marks****(a) Correct View (Point P)**

4

4 Marks

(b) Un-Sectioned View

24 Marks

- (i) Base Right End 2
- (ii) Base Top Right 2
- (iii) Base Top Left 2
- (iv) Hole in Base Top 2
- (v) Hole in Base Bottom 2
- (vi) Face of Left Web 2
- (vii) Face of Right Web 2
- (viii) Side of Centre Rib 2
- (ix) Side of Back Web 2
- (x) Intersecting Curve 2
- (xi) Cylinder Top Back 2
- (xii) Cylinder Top Front 2

(c) Sectioned View

6 Marks

- (i) Front of Base Left 1
- (ii) Front of Base Centre 1
- (iii) Front of Base Right 1
- (iv) Vertical Rib 1
- (v) Cylinder Face Internal 1
- (vi) Cylinder Face External 1

(d) Presentation

4 Marks

- (i) Excellent 4
- (ii) Very Good 3
- (iii) Good 2
- (iv) Fair 1

5B Bearings**12 Marks****(i) Ball Bearing**

4 Marks

- (a) Shaft 1
- (b) Ball Race 1
- (c) Sketch 2

(ii) Roller Bearing

4 Marks

- (a) Shaft 1
- (b) Roller Race 1
- (c) Sketch 2

(iii) Thrust Bearing

4 Marks

- (a) Shaft 1
- (b) Thrust Race 1
- (c) Sketch 2

QUESTION 5**SECTION B****(50 Marks)****5A Six Commands**

6 x 1

6 Marks**5B Six Commands Explanation****18 Marks**

Sketch

2

6 x 3

Note

1

5C Wire Frame**10 Marks**

(i) View as Given

2

(ii) Triangular Prism

(a) Slant Edge

1

2

(b) Base Edge

1

(iii) Rear Section

(a) Front Base Edge

1

6

(b) Rear Base Edge

1

(c) Base Side Edge

1

(d) Vertical Edge

1

(e) Curved Section

1

(f) Edge of Cylinder

1

5D CAD Terms**16 Marks**

(i) Grid Resolution

2

(ii) Snap Resolution

2

(iii) Polar Array

2

(iv) Rectangular Array

2

(v) Zoom

2

(vi) Scale

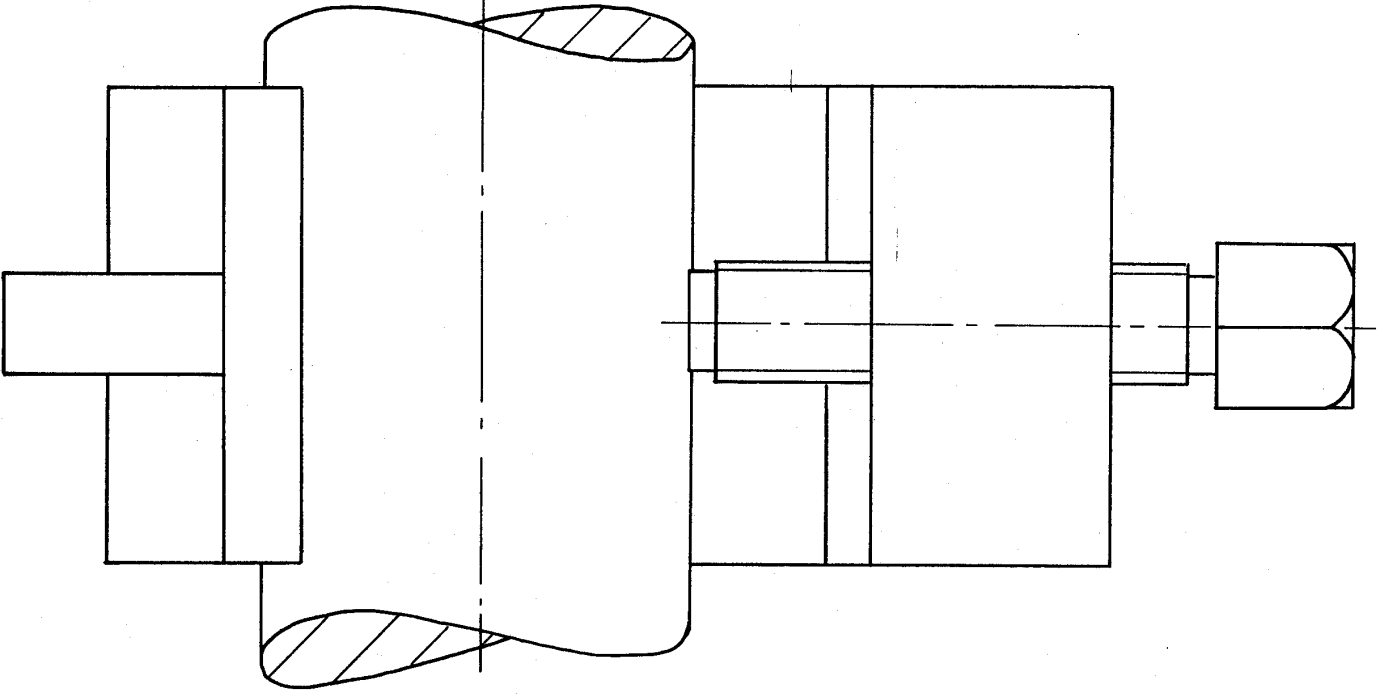
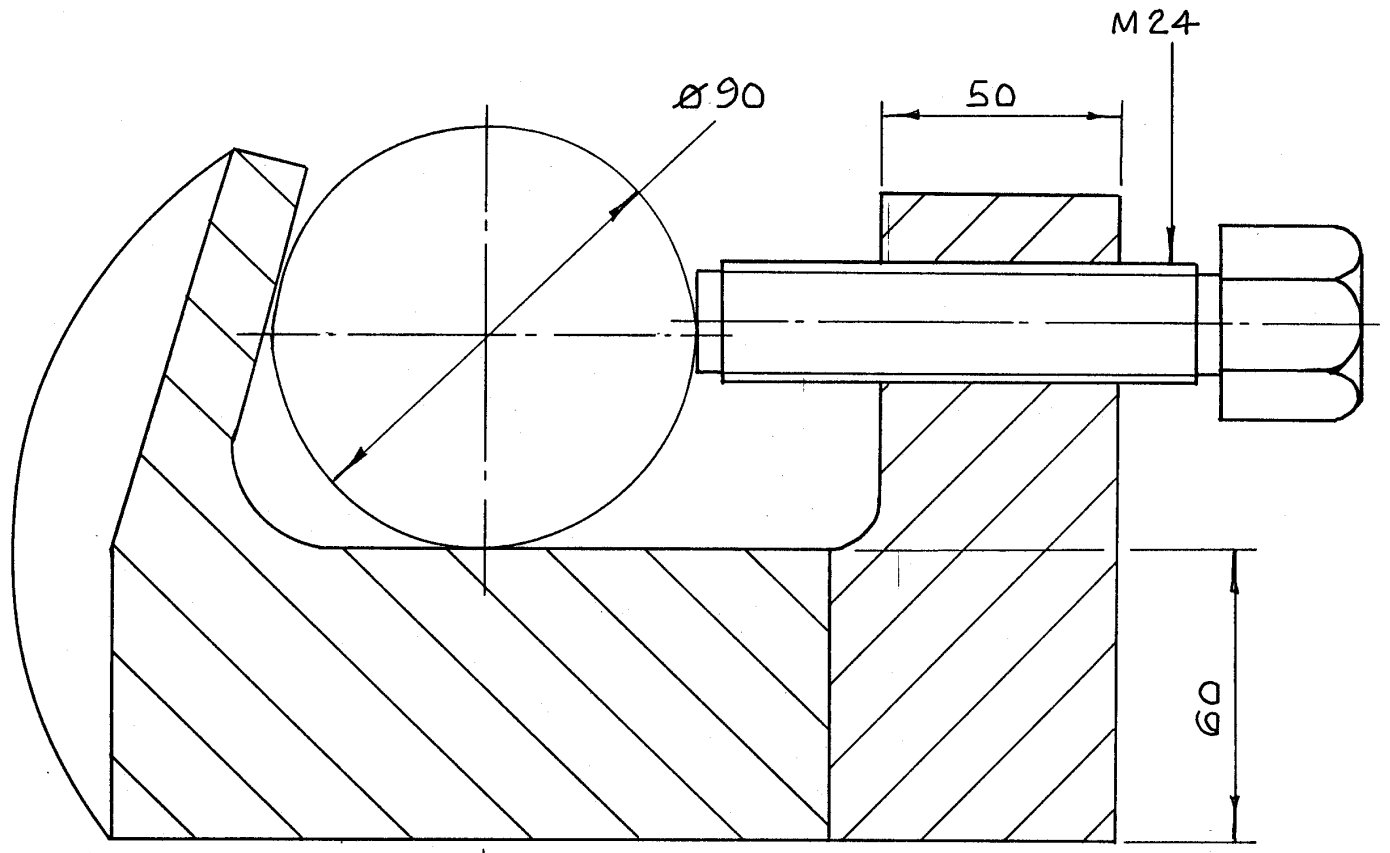
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(vii) Vector Graphics

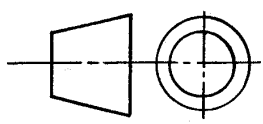
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(viii) Raster Graphics

2

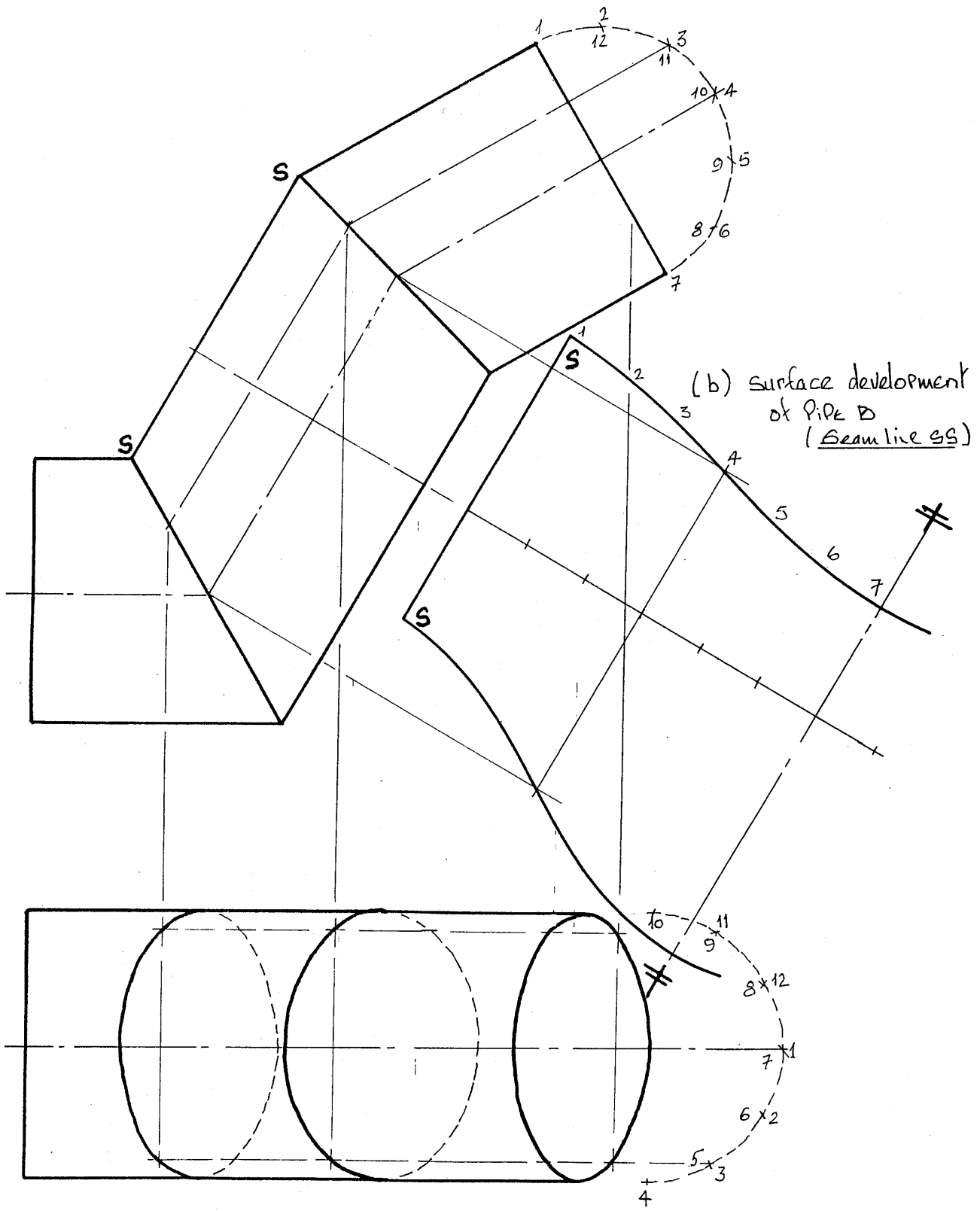


PROJECTION
TEILGEAN



BAR VICE ASSEMBLY

Q1. (a) & (b)

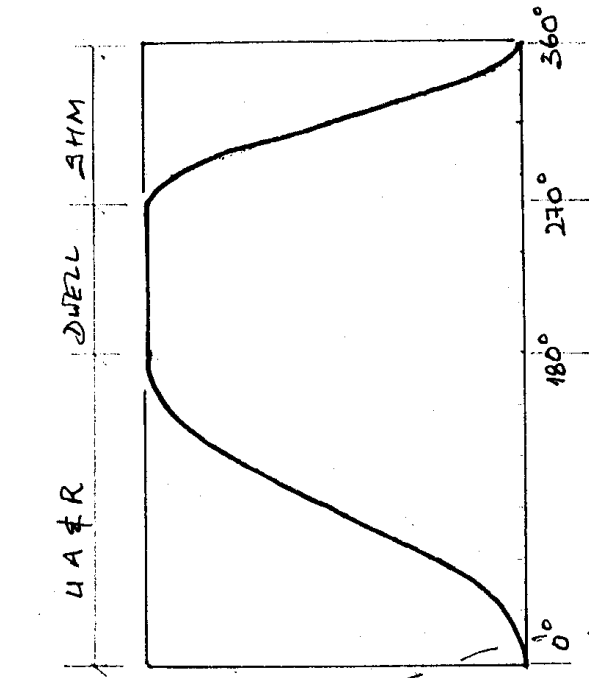


(a) Given Elevation & Plan

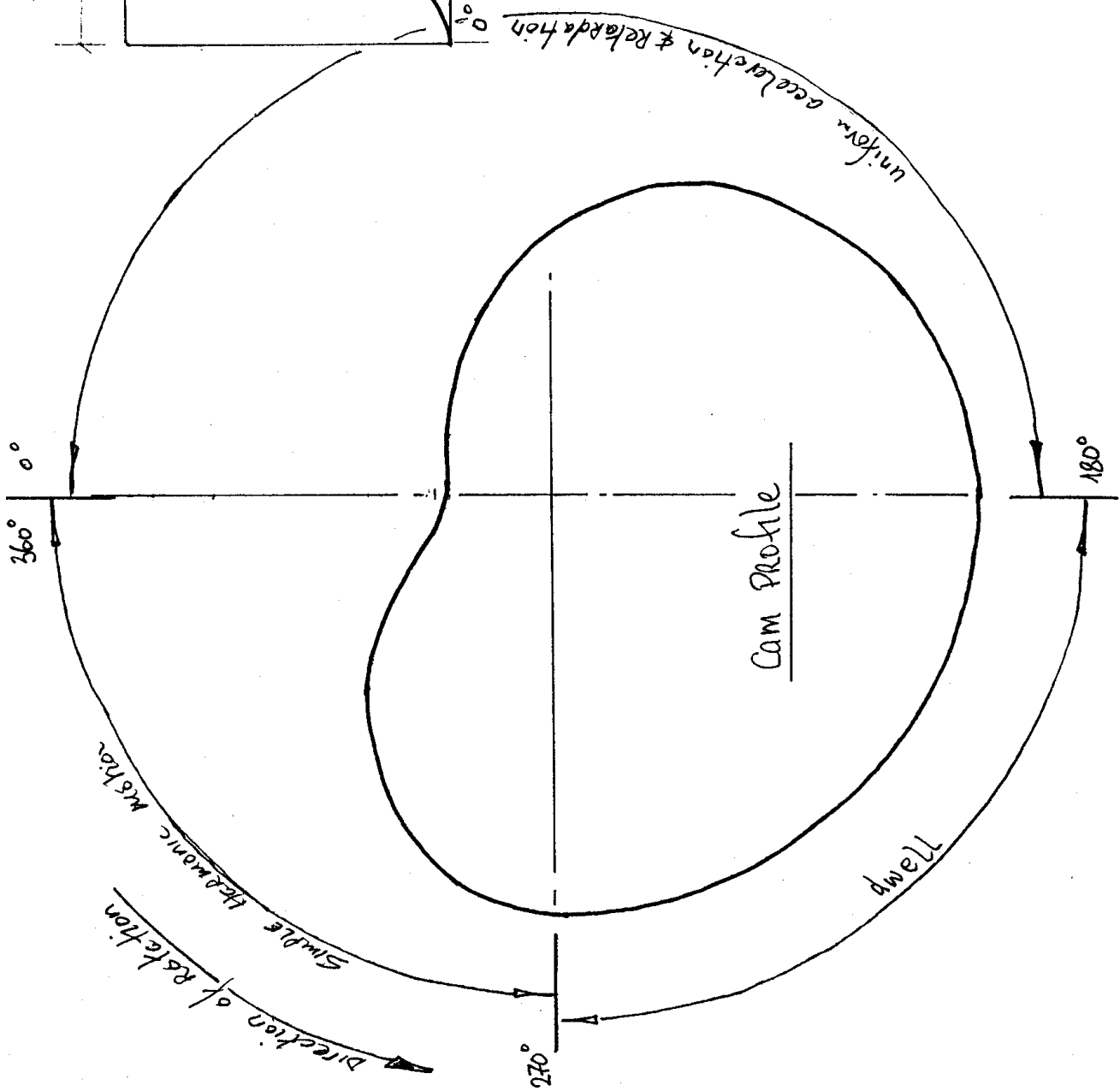
(c) Suitable Joint
(Grooved joint)

(b) Surface development
of Pipe D
(Seam line SS)

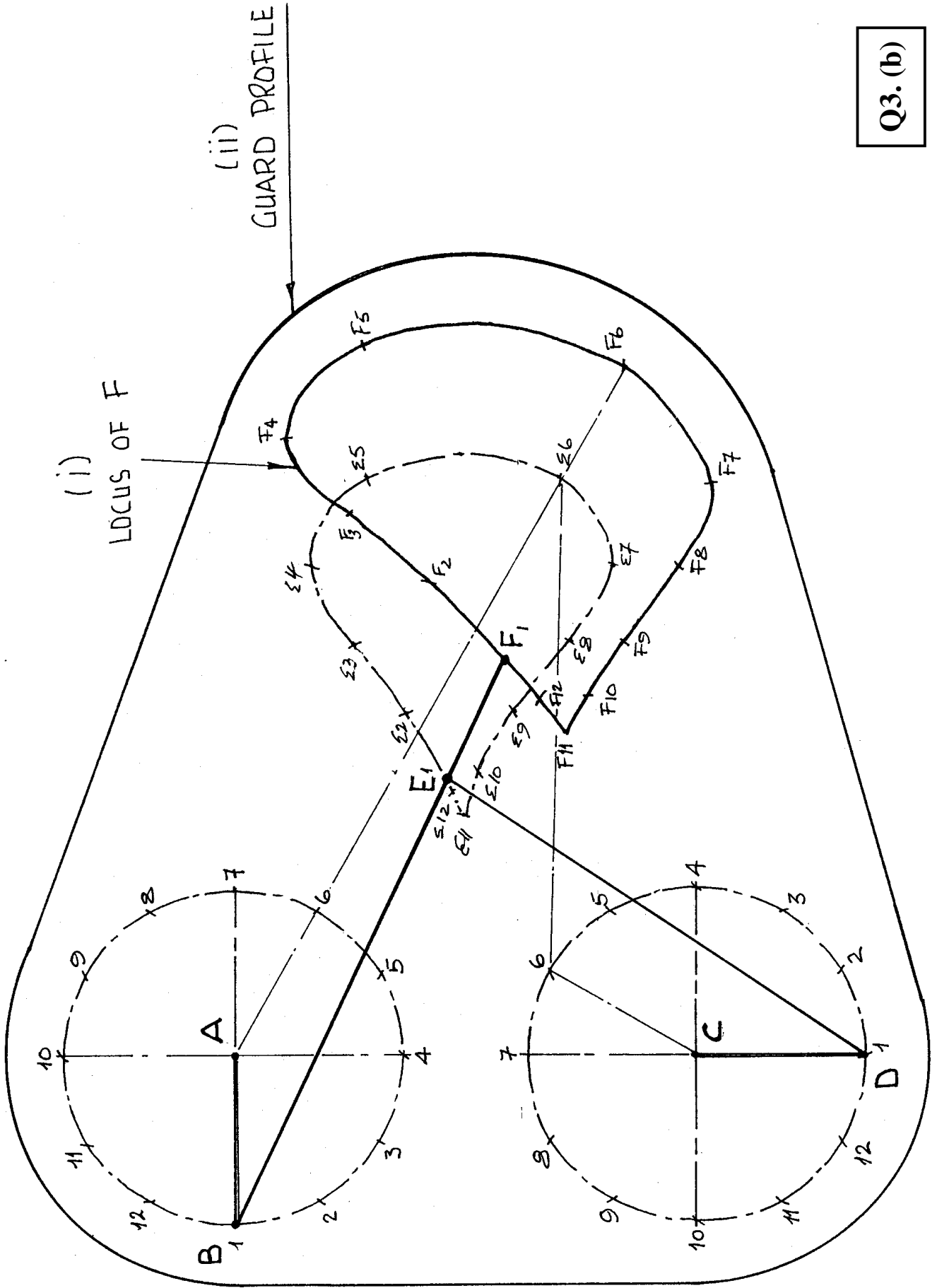
Q2. (a), (b) & (c)



DISPLACEMENT DIAGRAM

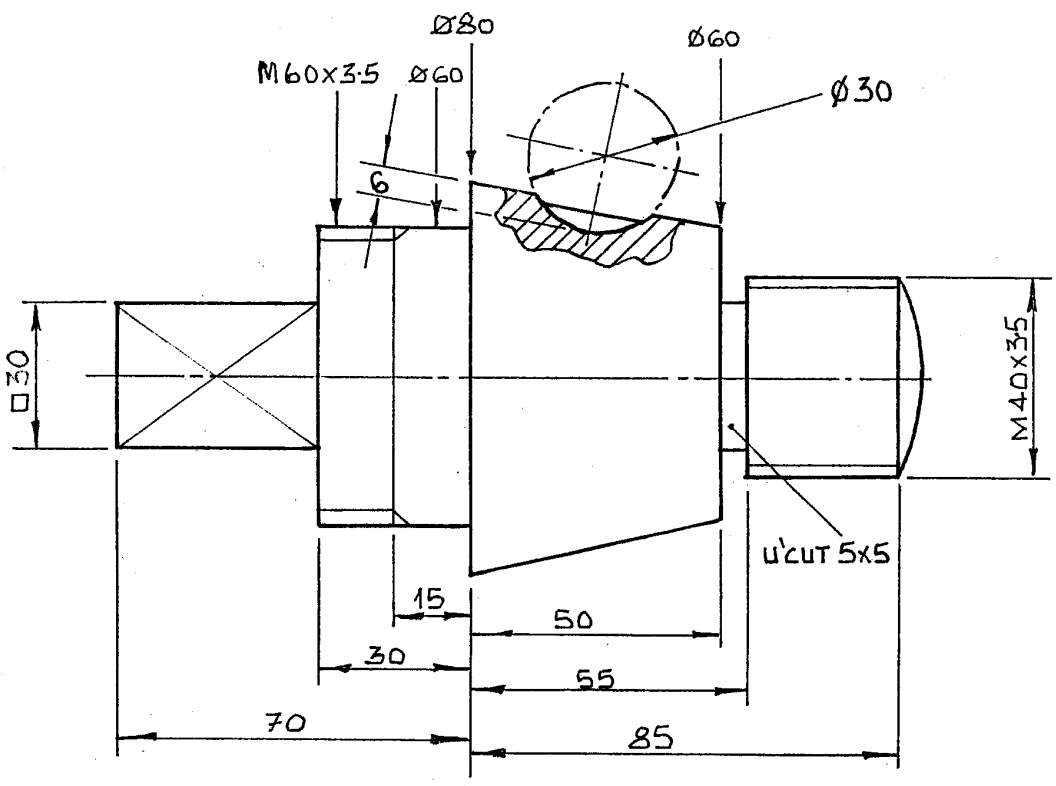


Q3. (a)



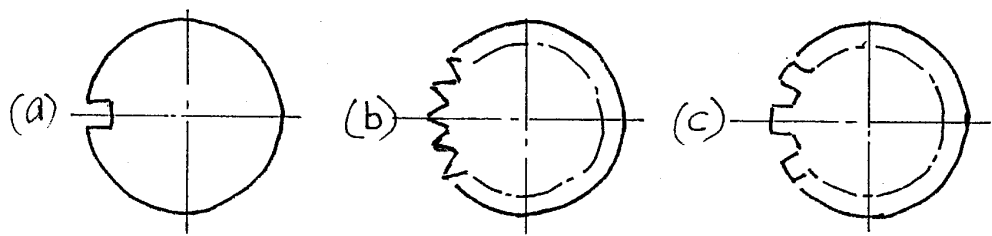
Q3. (b)

(a)



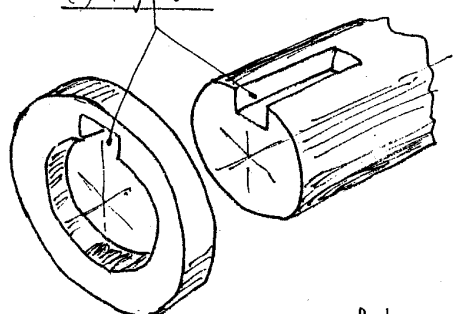
(b)

- (i) SCREWDOWN VALVE
- (ii) 1/ Handwheel 2/ PACKING 3/ VALVE SEAT
4/ GLAND STUD 5/ VALVE STEM.
- (iii) (a) KEYWAY (b) Serrations (c) SPLINES



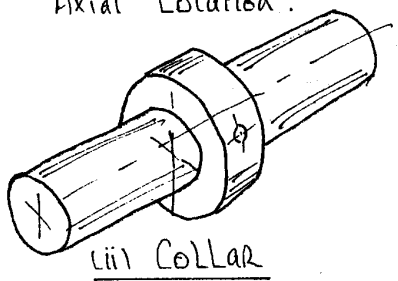
(c)

(i) Keyway.



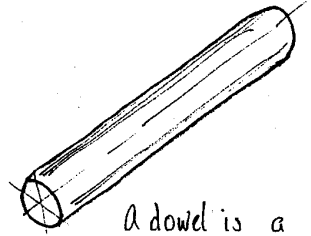
A keyway is a groove in a shaft or hub machined to accommodate a corresponding key.

A Collar is a separate ring of rectangular section or an integral part of a shaft used for Axial Location.



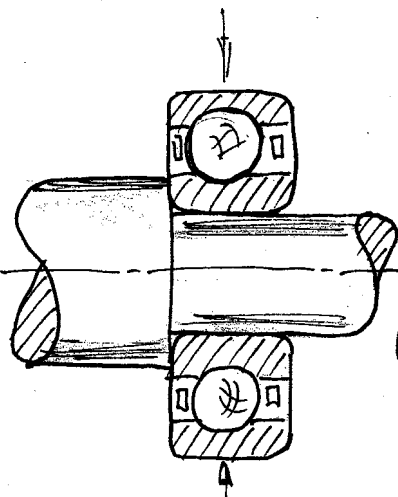
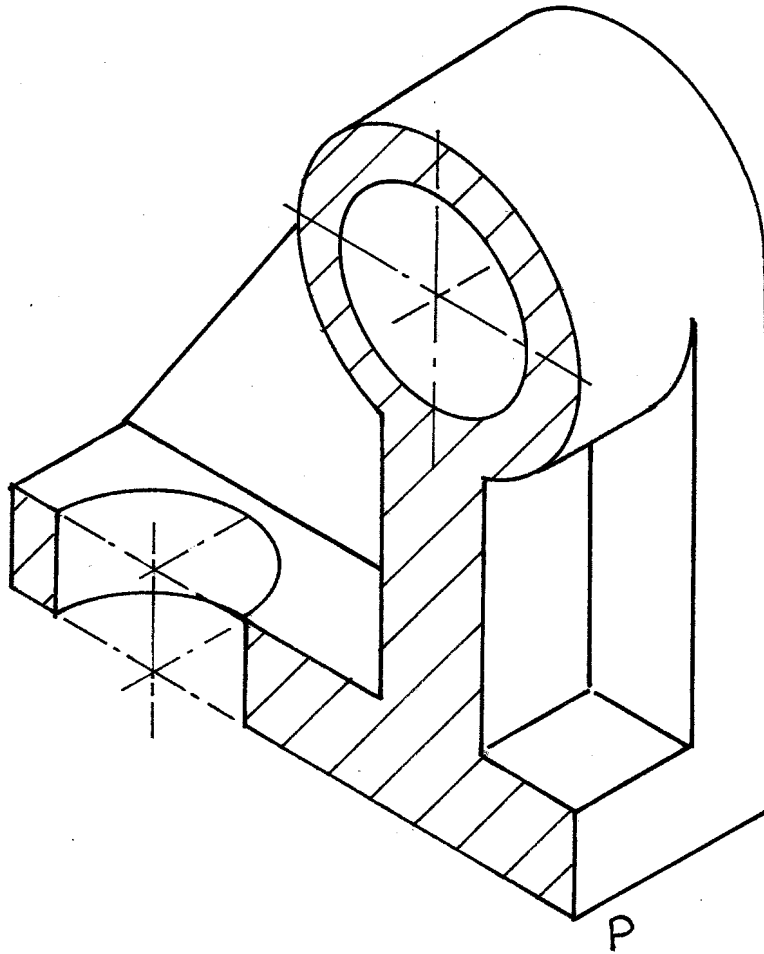
(ii) COLLAR

(iii) Dowel

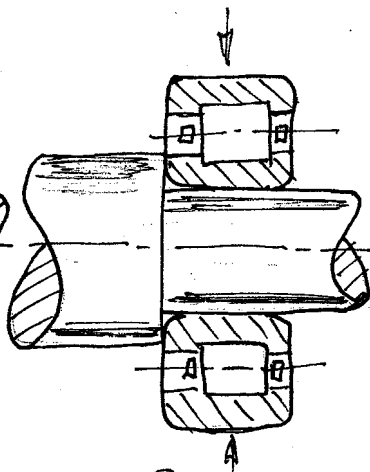


A dowel is a headless cylindrical pin used for precise location purposes.

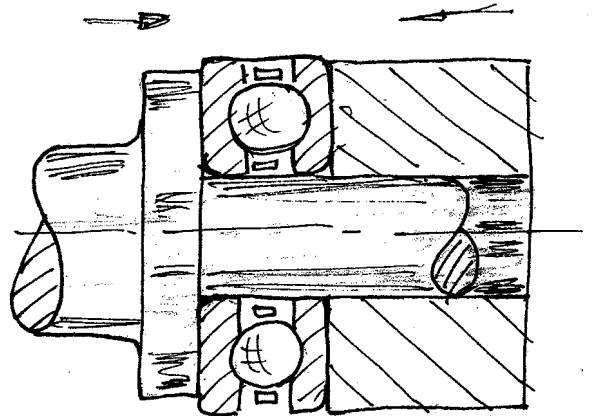
Q4. (a), (b) & (c)



(i) Ball Bearing



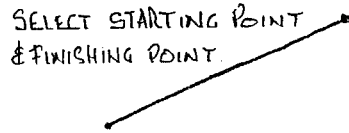
(ii) Roller Bearing



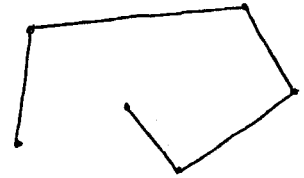
(iii) Thrust Bearing

Q.5 Section B - (a) & (b)

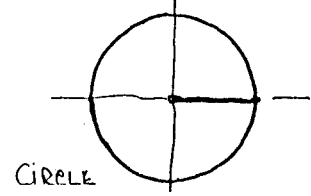
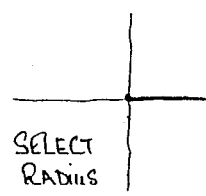
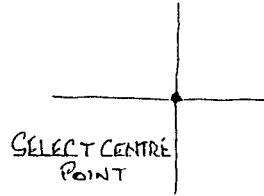
(i) **Line:** Command used to draw lines, which may be drawn as single or connected lines.



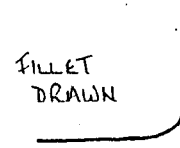
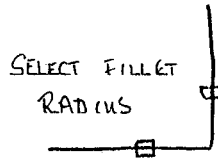
YOU MAY DRAW CONNECTED LINES



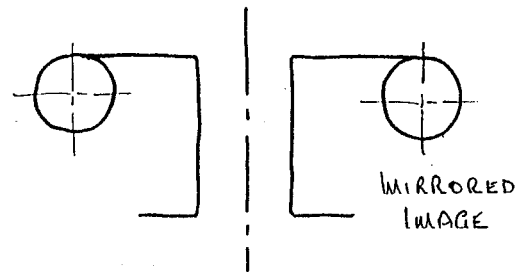
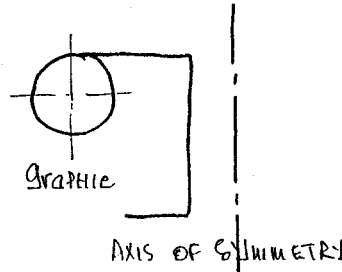
(ii) **Circle:** Command to a circle using several different methods, center & radius, center & diameter etc.



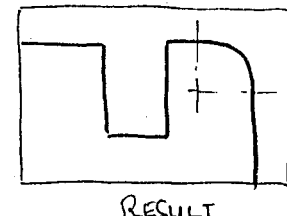
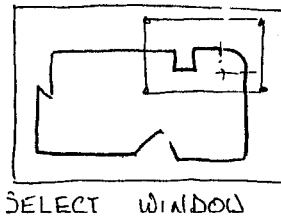
(iii) **Fillet:** Command used to draw tangential arc between adjoining lines or faces.



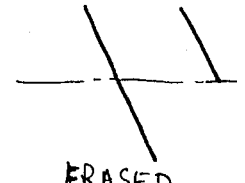
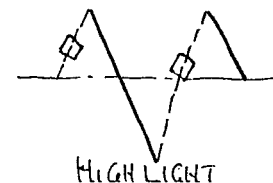
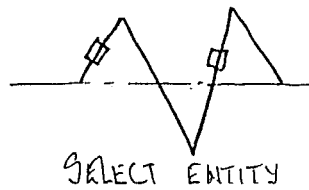
(iv) **Mirror:** Command used to generate a mirror image of a graphic about an axis of symmetry.



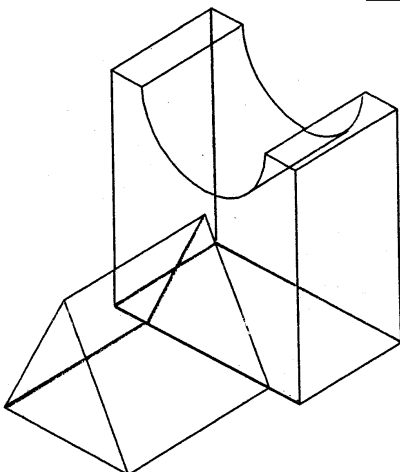
(v) **Zoom:** Command used to magnify parts of a drawing to edit fine details.



(vi) **Erase:** Command used to erase an entity or group of entities in a drawing.



(c)



(d) (i) **Grid Res.:** Displays a rectangular array of reference dots at user defined increments.

Snap Res.: Restricts crosshair movement to a given increment

(ii) **Polar Array:** Copies an object about a central point.

Rectangular Array: Copies an object in rows and/or columns.

(iii) **Zoom:** Magnifies a portion of a drawing to make changes at a finer level of detail.

Scale: Enlarges/reduces a drawing by adjusting its size proportionally

(iv) **Vector Graphics:** An image type comprising collections of lines rather than patterns of individual dots. Images can thus be scaled without loss of quality. (Usually small file sizes).

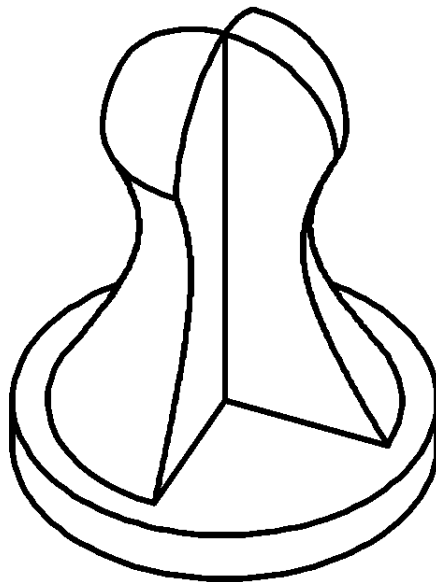
Raster Graphics: Images comprised of small dots (pixels) in rows and columns. (Generally large file sizes).



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State Examinations Commission

Leaving Certificate Examination 2004

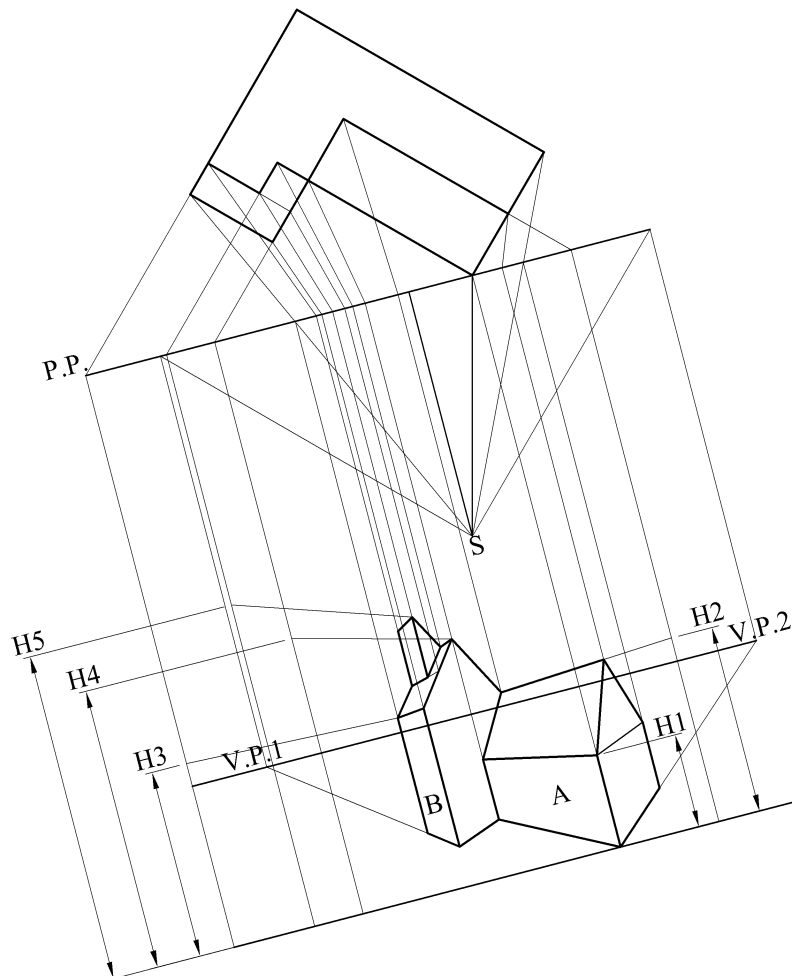
Technical Drawing
Paper II(B) – Ordinary Level
(Building Applications)



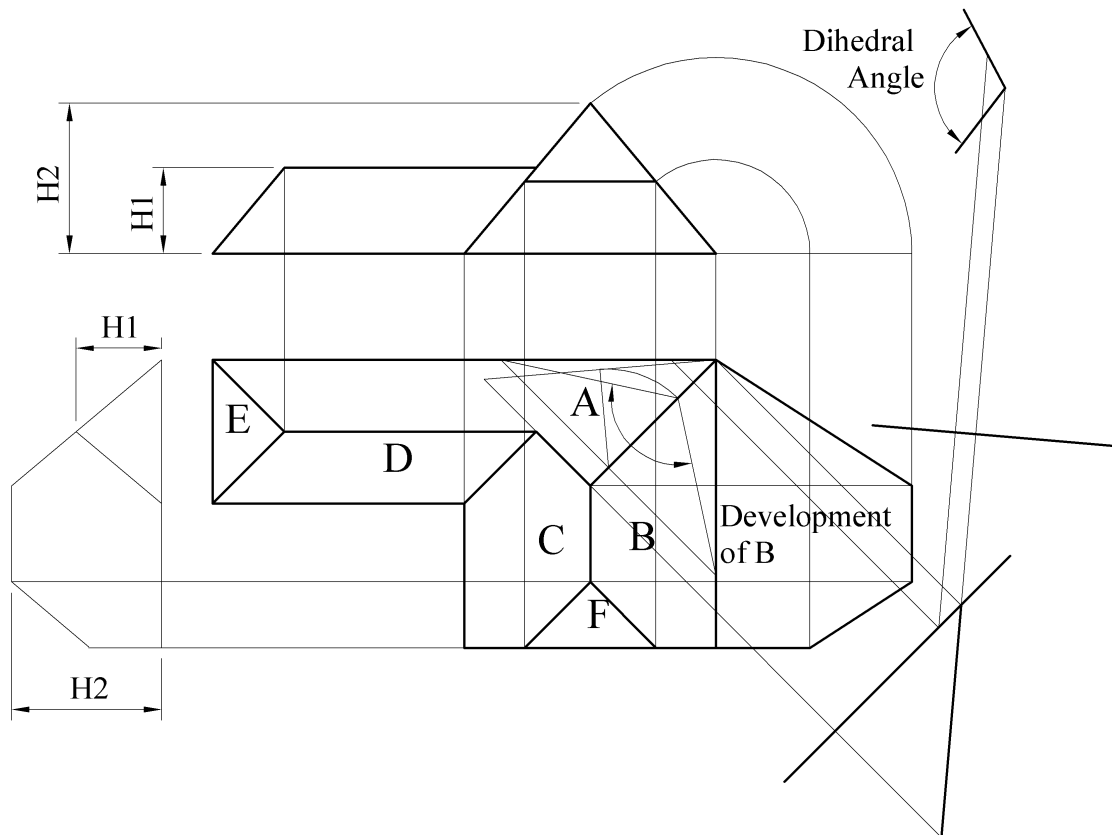
Marking Scheme
& Solutions

(Other valid solutions are acceptable and marked accordingly)

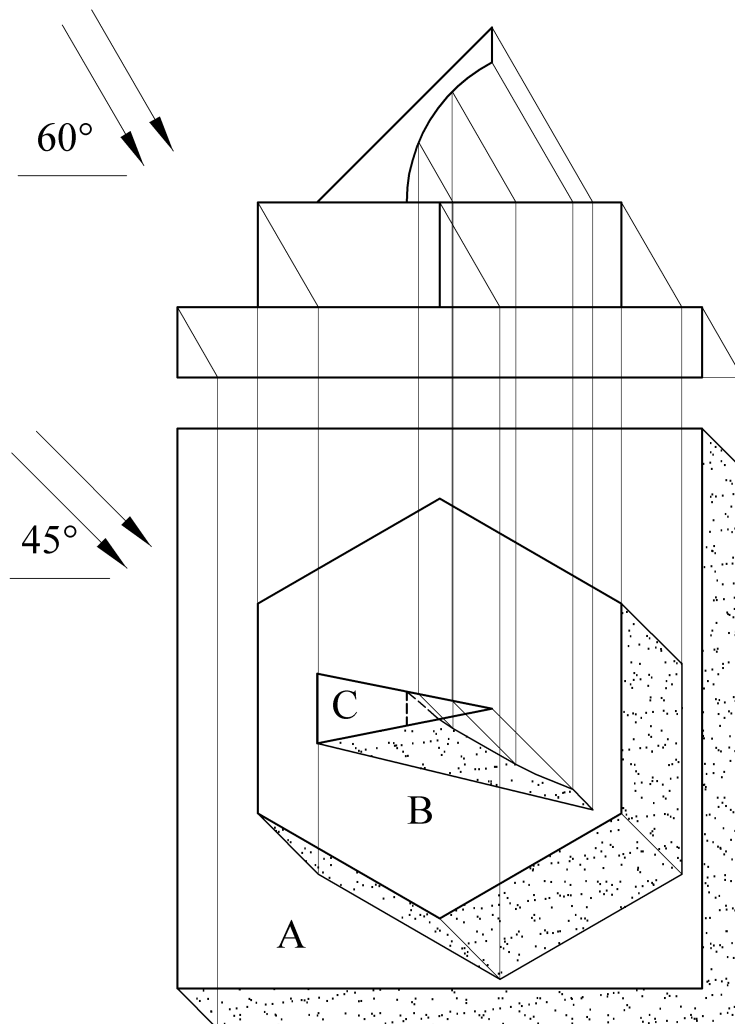
| <u>QUESTION 1</u> | | Marks |
|--------------------------|--|-----------|
| 1) | Draw the given plan | 4 |
| 2) | Position spectator, P.P., V.P.1 and V.P.2 in plan. (1,2,2) | 5 |
| 3) | Ground line, horizon line and V.P.'s in elevation. (1,1,1,1) | 4 |
| 4) | Projection lines from S to plan | 2 |
| 5) | Perspective of base lines of block A. (2,2) | 4 |
| 6) | Apply H1 for block A | 1 |
| 7) | Apply H2 and complete block A. (3,5X1) | 8 |
| 8) | Establish base of block B | 2 |
| 9) | Apply H3, H4, and complete block B. (1,1,5X1) | 7 |
| 10) | Establish lines of intersection on dormer | 2 |
| 11) | Apply H5 and complete dormer | 6 |
| 12) | Presentation | 5 |
| Total | | 50 |



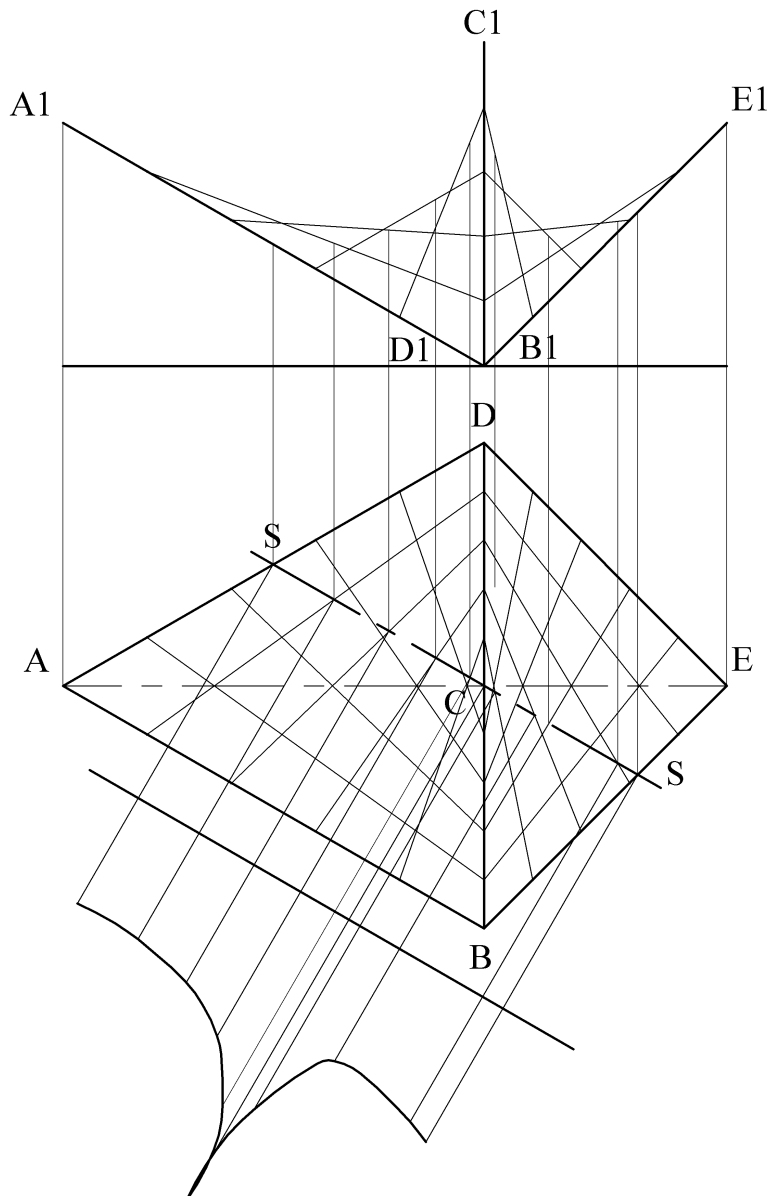
| <u>QUESTION 2</u> | | | Marks |
|--------------------------|---|--|-----------|
| 1) | Draw roof perimeter in plan. | | 5 |
| 2) | Draw surfaces B and C in elevation. (2,2) | | 4 |
| 3) | Draw edge view of surfaces A and D, Measure height 1 and draw in elevation. (2,2,1) | | 5 |
| 4) | Determine lines of intersection between A and B, C and D, and A and C in plan (1,1,1) | | 3 |
| 5) | Draw surface E in elevation and project to plan. (1,1) | | 2 |
| 6) | Construction to determine surface F and project to plan. (3,1) | | 4 |
| 7) | Complete the plan and elevation (1,1) | | 2 |
| 8) | <u>Development of surface B</u> | | |
| | Determine true widths (2,2) | | 4 |
| 9) | Draw the development of surface B (5X1) | | 5 |
| 10) | <u>Dihedral angle between A and B</u> | | |
| | True length of line of intersection. (4x1) | | 4 |
| 11) | Construction to determine dihedral angle. (6x1) | | 6 |
| 12) | Dihedral angle between surfaces A and B | | 1 |
| 13) | Presentation | | 5 |
| Total | | | 50 |



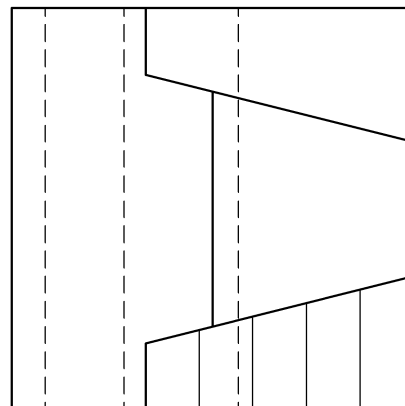
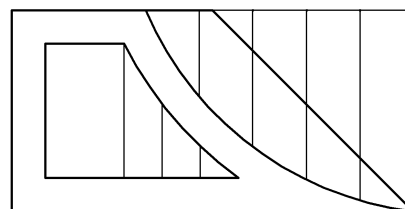
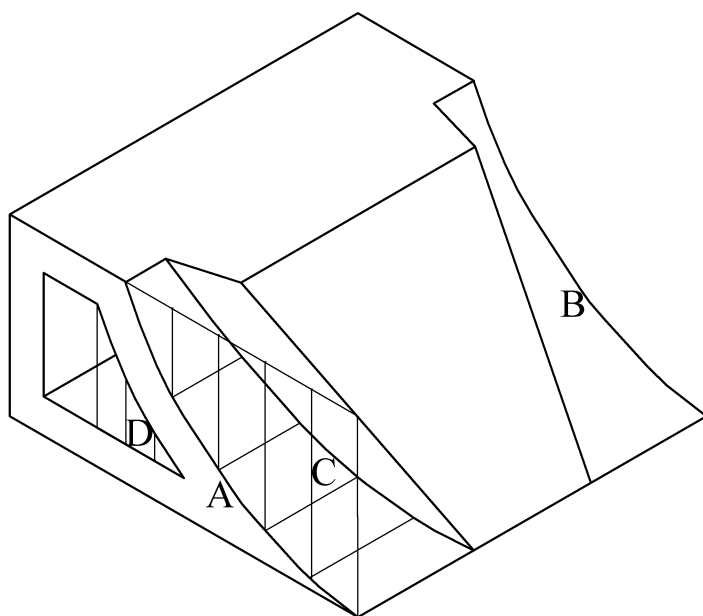
| <u>QUESTION 3</u> | | | Marks |
|--------------------------|--|--------|-----------|
| 1) | Draw the given plan and elevation | (4,4) | 8 |
| 2) | Lines at appropriate angles in plan and elevation | (2,2) | 4 |
| 3) | Determine shadow cast by block A | (4X2) | 8 |
| 4) | Determine shadow cast by block B on block A | (5X1) | 5 |
| 5) | Shadow cast by sloping line of block C | | 3 |
| 6) | Shadow cast by vertical line on block C | | 2 |
| 7) | Method to determine shadow cast by curved surface of block C | | 6 |
| 8) | Draw curve in plan | | 3 |
| 9) | Identify shadow cast. | | 6 |
| 10) | Presentation | | 5 |
| Total | | | 50 |



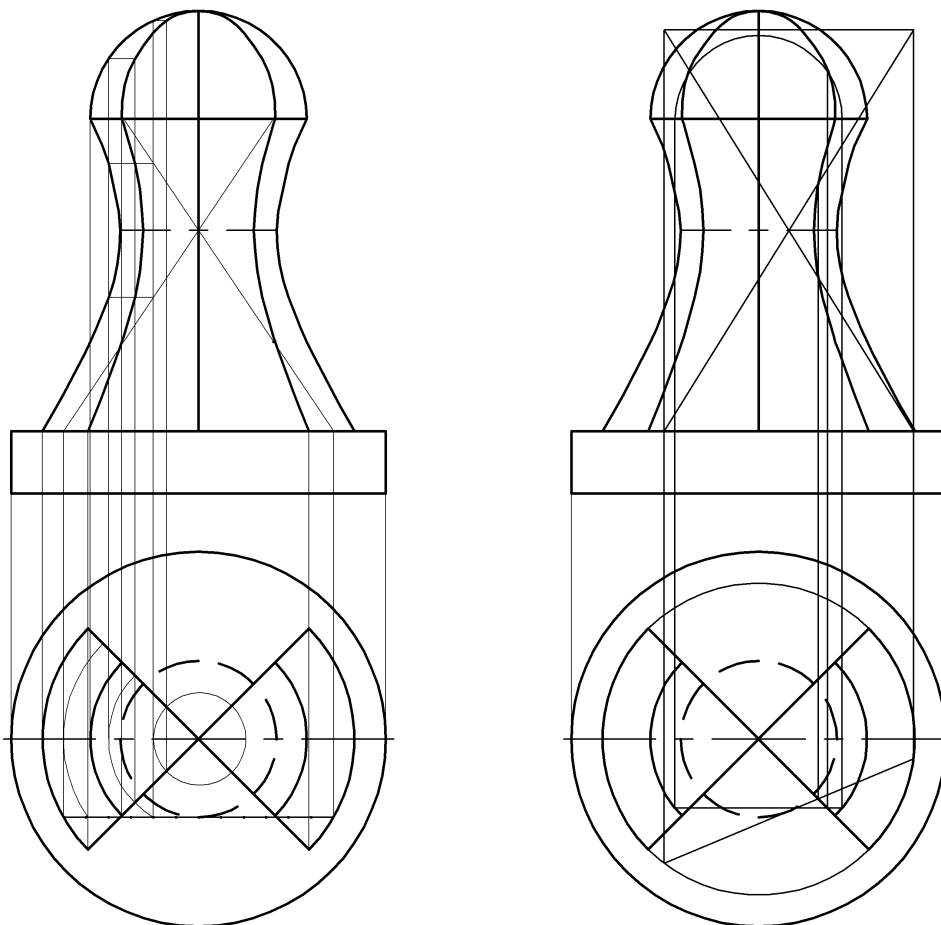
| <u>QUESTION 4</u> | | | Marks |
|--------------------------|--|-------|-----------|
| 1) | <u>Plan and elevation</u> | | |
| | Draw the given plan, including the elements. | (4,6) | 10 |
| 2) | Measure heights and project outline elevation. | (6,2) | 8 |
| 3) | Draw outline elevation. | (3x1) | 3 |
| 4) | Draw elements in elevation. | (4,4) | 8 |
| 5) | <u>True shape of section</u> | | |
| | New X Y line parallel to SS | | 3 |
| 6) | Method for determining heights for true shape | | 5 |
| 7) | Measure heights in auxiliary elevation | | 5 |
| 8) | Draw the true shape | | 3 |
| 9) | Presentation | | 5 |
| Total | | | 50 |



| <u>QUESTION 5</u> | | | Marks |
|--------------------------|---|---------|-----------|
| 1) | Draw the given views | (3,3,1) | 7 |
| 2) | Grid on arcs in elevation | (2,2) | 4 |
| 3) | Outline isometric of base of ramp | (2,2) | 4 |
| 4) | Complete outline isometric | (4x1) | 4 |
| 5) | Grid for curve A in isometric | | 5 |
| 6) | Grid for curve C in isometric | | 5 |
| 7) | Grid for curve B in isometric | | 2 |
| 8) | Draw curves A, B and C in isometric | | 3 |
| 9) | Establish ramp surface in isometric | (1x5) | 5 |
| 10) | Outline opening in isometric | | 3 |
| 11) | Curve on opening in isometric and complete opening. (2,1) | | 3 |
| 12) | Presentation | | 5 |
| Total | | | 50 |



| <u>QUESTION 6</u> | | Marks |
|--------------------------|--|-----------|
| 1) | Draw three given circles in plan, axis and projections of circles in elevation (7x1) | 7 |
| 2) | Tangent to throat circle in plan | 4 |
| 3) | Establish asymptotes in elevation (tangents to throat circle in plan) | 4 |
| 4) | Cross sections in plan (project tangents to elevation) | 4 |
| 5) | Establish points in elevation (elevation of tangents) | 5 |
| 6) | Draw curves in elevation | 4 |
| 7) | Determine diameter of dome and draw in plan | 4 |
| 8) | Draw sections in plan and hemisphere in elevation (3x1) | 3 |
| 9) | Method for determining sections of hyperboloid of revolution in elevation | 3 |
| 10) | Method for determining sections of dome in elevation | 3 |
| 11) | Complete elevation | 4 |
| 12) | Presentation | 5 |
| Total | | 50 |



| <u>QUESTION 7</u> | | Marks |
|--------------------------|---|-----------|
| 1) | <u>Profile</u> Measure heights and draw horizontal sections. | 5 |
| 2) | Projections from intersections of line DE with contours to profile | 5 |
| 3) | Draw outline profile | 8 |
| 4) | <u>Dip and strike</u> Join points A, B and C in plan. | 3 |
| 5) | Draw triangle in elevation | 6 |
| 6) | Horizontal line in elevation | 2 |
| 7) | Strike in plan | 2 |
| 8) | New XY line, viewing direction for dip | 2 |
| 9) | Determine dip | 1 |
| 10) | <u>Observation tower.</u> Project intersections of contours with FG at right angles to FG | 2 |
| 11) | Measure heights, draw profile | 2 |
| 12) | Draw tangents, determine minimum height | 7 |
| 13) | Presentation | 5 |
| Total | | 50 |

