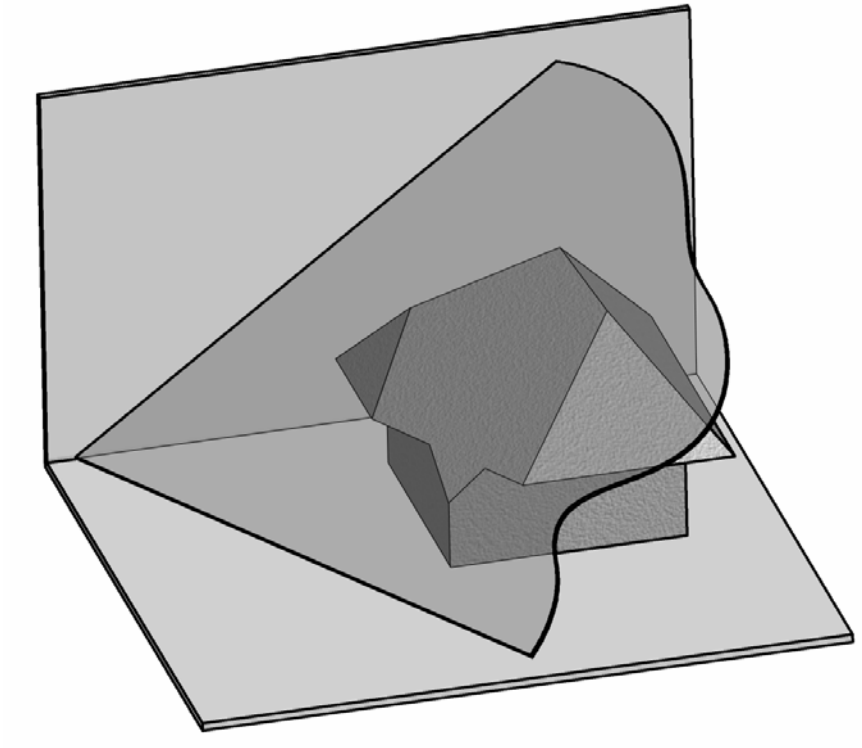
**Coimisiún na Scrúduithe Stáit**
***State Examinations Commission***

***Leaving Certificate Examination 2006***

# *Technical Drawing*
## *Paper 1 - Ordinary Level*
## *(Plane & Solid Geometry)*



# *Marking Scheme and Sample Solutions*

**(Other valid solutions are acceptable and marked accordingly)**

# Leaving Certificate 2006 Technical Drawing

**Paper 1** **Ordinary Level** **Marking Scheme**

## Question 1

| | | | Marks |
|---|---|---|---|
| **(a)** | **Elevation** | **19** | |
| | 1. | Outline elevation | **7** |
| | 2. | Locate point b | **2** |
| | 3. | Lines R and S | **4** |
| | 4. | Locate points c and d | **2** |
| | 5. | Locate points on curve | **2** |
| | 6. | Draw the curve | **2** |
| **(b)** | **Plan** | **7** | |
| | 7. | Outline the plan | **5** |
| | 8. | Complete the plan | **2** |
| **(c)** | **New Elevation** | **19** | |
| | 9. | $X_1Y_1$ parallel to the plan of A | **2** |
| | 10. | Projections from the plan | **2** |
| | 11. | Heights from the elevation (Excl. curve) | **4** |
| | 12. | Surface A | **4** |
| | 13. | Points on freehand curve | **3** |
| | 14. | Complete new elevation | **4** |
| | 15. | ***Presentation*** **5** | **5** |
| | | **Total** | **50** |

# Leaving Certificate 2006 Technical Drawing

**Paper 1** **Ordinary Level** **Marking Scheme**

## Question 2

| | | | Marks |
|---|---|---|---|
| **(a)** | **Triangle ABC** | **16** | |
| 1. | Draw the line AB 125 long | | **2** |
| 2. | Geometrical division of 195 | | **6** |
| 3. | Locate point C | | **4** |
| 4. | Draw lines AC and BC | | **4** |
| | **Point D** | **12** | |
| 5. | Mark the altitude | | **4** |
| 6. | Locate point D | | **4** |
| 7. | Draw lines AD and CD | | **4** |
| **(b)** | **Area Conversion** | **17** | |
| 8. | Convert ABCD to a triangle | | **4** |
| 9. | Triangle to a rectangle | | **4** |
| 10. | Area of rectangle reduced by 0.25 | | **3** |
| 11. | Rectangle to a square | | **4** |
| 12. | Draw the square | | **2** |
| 13. | ***Presentation*** | **5** | **5** |
| | | **Total** | **50** |

# Leaving Certificate 2006 Technical Drawing

**Paper 1** **Ordinary Level** **Marking Scheme**

## Question 3

| | | | Marks |
|---|---|---|---|
| **(a)** | **Elevation** | **15** | |
| | 1. Draw cone A, sphere B (2,4) | | **6** |
| | 2. Locate point P | | **3** |
| | **Plan** | | |
| | 3. Cone A inc. point P (2,1) | | **3** |
| | 4. Sphere B | | **3** |
| **(b)** | **Sphere C** | **17** | |
| | 5. Points r and s in elevation | | **4** |
| | 6. Point $t_1$ in plan | | **5** |
| | 7. Point t in elevation | | **4** |
| | 8. Draw both spheres | | **4** |
| **(c)** | **Sphere D** | **13** | |
| | 9. Locating point O | | **6** |
| | 10. Locating point $O_1$ | | **3** |
| | 11. Draw the spheres | | **4** |
| | 12. ***Presentation*** | **5** | **5** |
| | | **Total** | **50** |

# Leaving Certificate 2006 Technical Drawing

**Paper 1** **Ordinary Level** **Marking Scheme**

## Question 4

| | | Marks |
|---|---|---|
| **Setting up** | **4** | |
| 1. | Given lines AB and BC, Circles R and S (1,1,1,1) | **4** |
| **Locus of P on circle R** | **17** | |
| 2. | Division of the circle | **2** |
| 3. | Centres marked on line de | **4** |
| 4. | Project from divisions of circle | **3** |
| 5. | Locate points on locus | **6** |
| 6. | Draw the locus | **2** |
| **Locus of Q on circle S** | **24** | |
| 7. | Circle at centre f | **4** |
| 8. | Locate point $Q_1$ | **3** |
| 9. | Division of circle | **2** |
| 10. | Centres marked on line fg | **3** |
| 11. | Project from divisions on circle | **3** |
| 12. | Locate points on the locus | **5** |
| 13. | Draw the locus (compass, freehand curve 2,2) | **4** |
| 14. | ***Presentation*** **5** | **5** |
| | **Total** | **50** |

# Leaving Certificate 2006 Technical Drawing

**Paper 1** **Ordinary Level** **Marking Scheme**

## Question 5

| | | Marks |
|---|---|---|
| **(a)** | **Setting up** **12** | |
| 1. | Given plan | **5** |
| 2. | Given elevation | **5** |
| 3. | Traces VTH | **2** |
| | **Auxiliary Elevation** **9** | |
| 4. | $X_1Y_1$ perp. to H.T. | **2** |
| 5. | Projections from plan | **2** |
| 6. | Edge view of the plane | **2** |
| 7. | Auxiliary view the of solid | **3** |
| | **Truncation** **18** | |
| 8. | Points abcdefg in plan (7x1) | **7** |
| 9. | Points abcdeh in elevation (6x1) | **6** |
| 10. | Complete the plan | **3** |
| 11. | Complete the elevation | **2** |
| **(b)** | **True shape** **6** | |
| 12. | Setting up the true lengths and widths | **4** |
| 13. | Draw the true shape | **2** |
| 14. | ***Presentation*** **5** | **5** |
| | **Total** | **50** |

# Leaving Certificate 2006 Technical Drawing

**Paper 1** **Ordinary Level** **Marking Scheme**

## Question 6

| | | Marks |
|---|---|---|
| **(a)** | **Parabola** **21** | |
| 1. | Set up the focus and vertex as given | **6** |
| 2. | Locate directrix | **4** |
| 3. | Set up the correct eccentricity for curve | **3** |
| 4. | Points on the curve | **4** |
| 5. | Draw the curve | **4** |
| **(b)** | **Hyperbola** **24** | |
| 6. | Set up as given (2,2,2) | **6** |
| 7. | Locate the focus | **4** |
| 8. | Locate the vertex | **3** |
| 9. | Set up the correct eccentricity for curve | **3** |
| 10. | Points on the curve | **4** |
| 11. | Draw the curve | **4** |
| 12. | ***Presentation*** **5** | **5** |
| | **Total** | **50** |

# Leaving Certificate 2006 Technical Drawing

**Paper 1** **Ordinary Level** **Marking Scheme**

## Question 7

**Marks**

**(a) Given views** **16**

1. Given plan ..... **8**
2. Given elevation..... **8**

**(b) End elevation** **10**

3. Triangular prism ..... **5**
4. Irregular prism ..... **5**

**Interpenetration** **19**

5. Points c, d and f ..... **6**
6. Points a, b, e and g..... **4**
7. Complete the elevation..... **6**
8. Hidden detail. ..... **3**

9. ***Presentation*** **5** ..... **5**

**Total ..... 50**

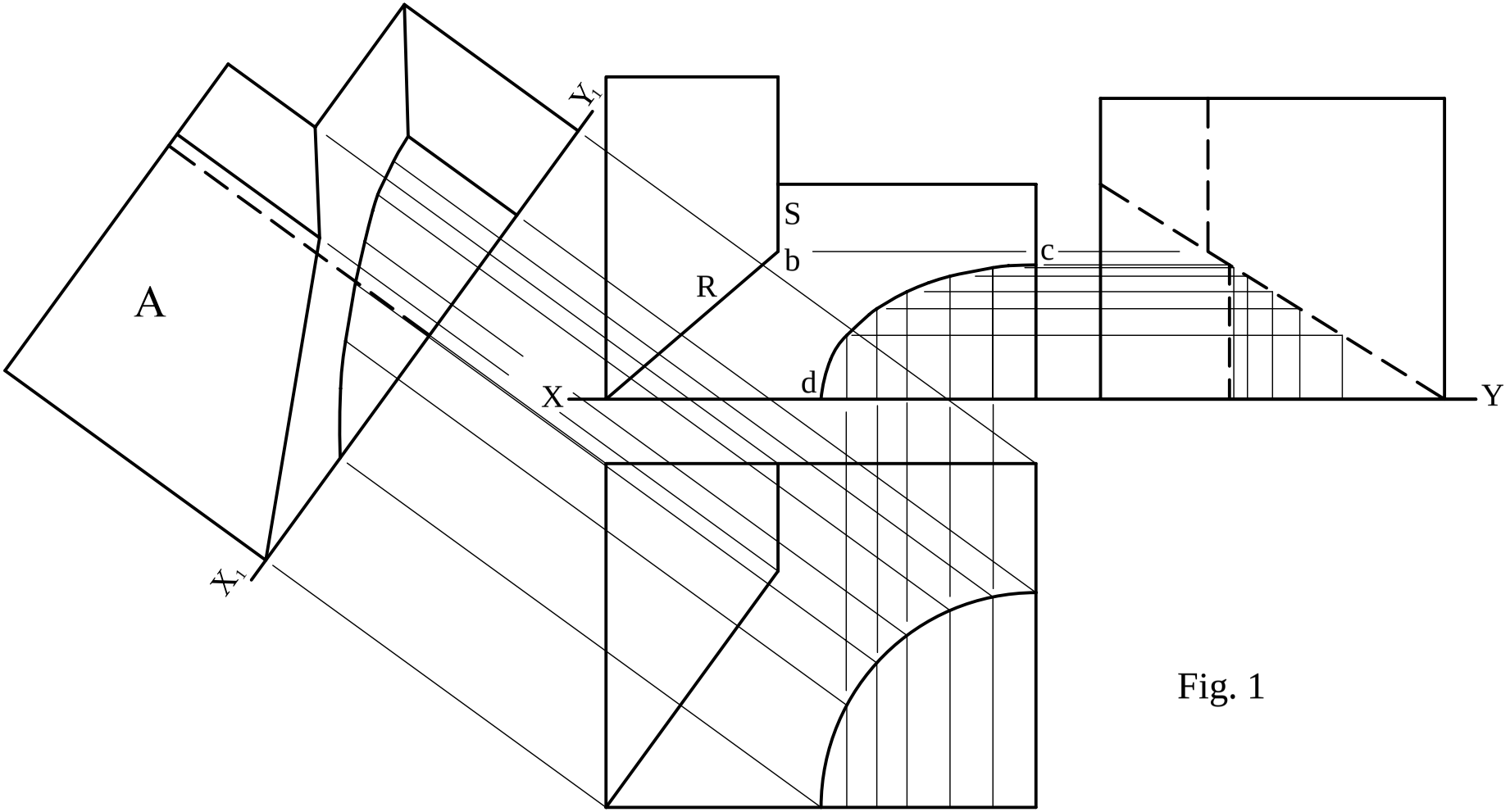
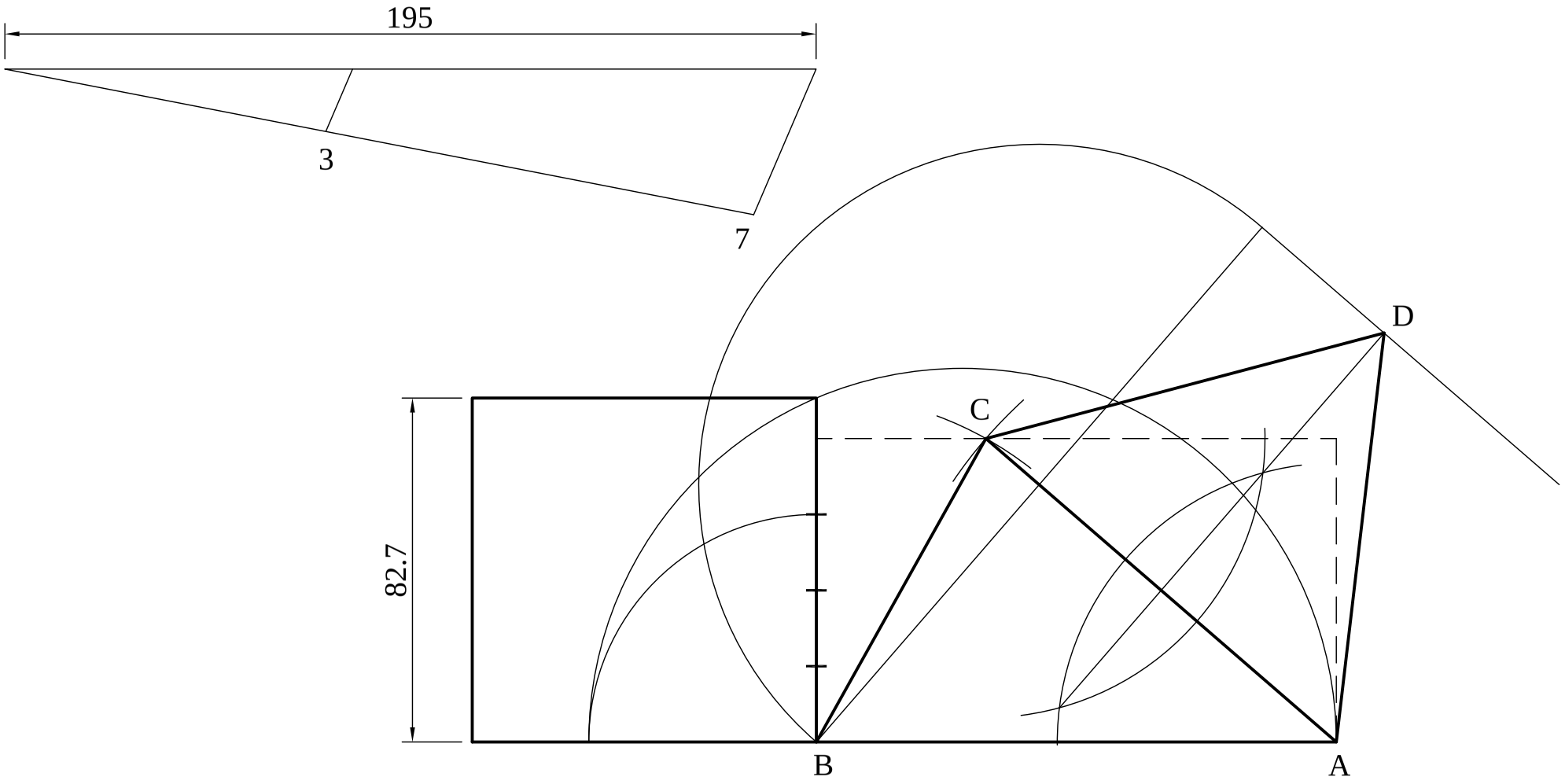
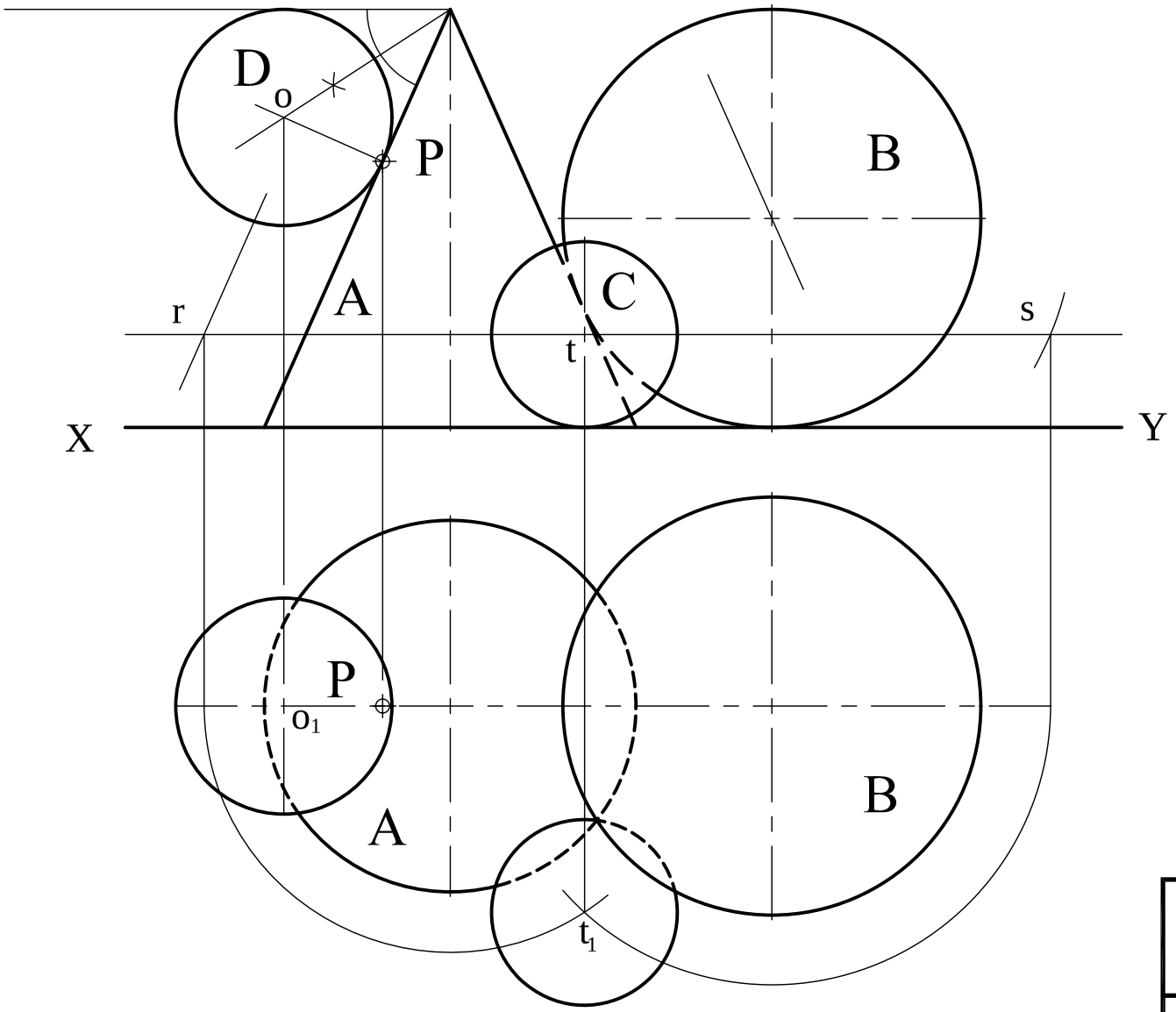



Fig. 1

| TECHNICAL DRAWING<br>PAPER 1 ORDINARY LEVEL | |
|---|---|
| QUESTION 1 | 2006 |
| SCALE: N/A | |



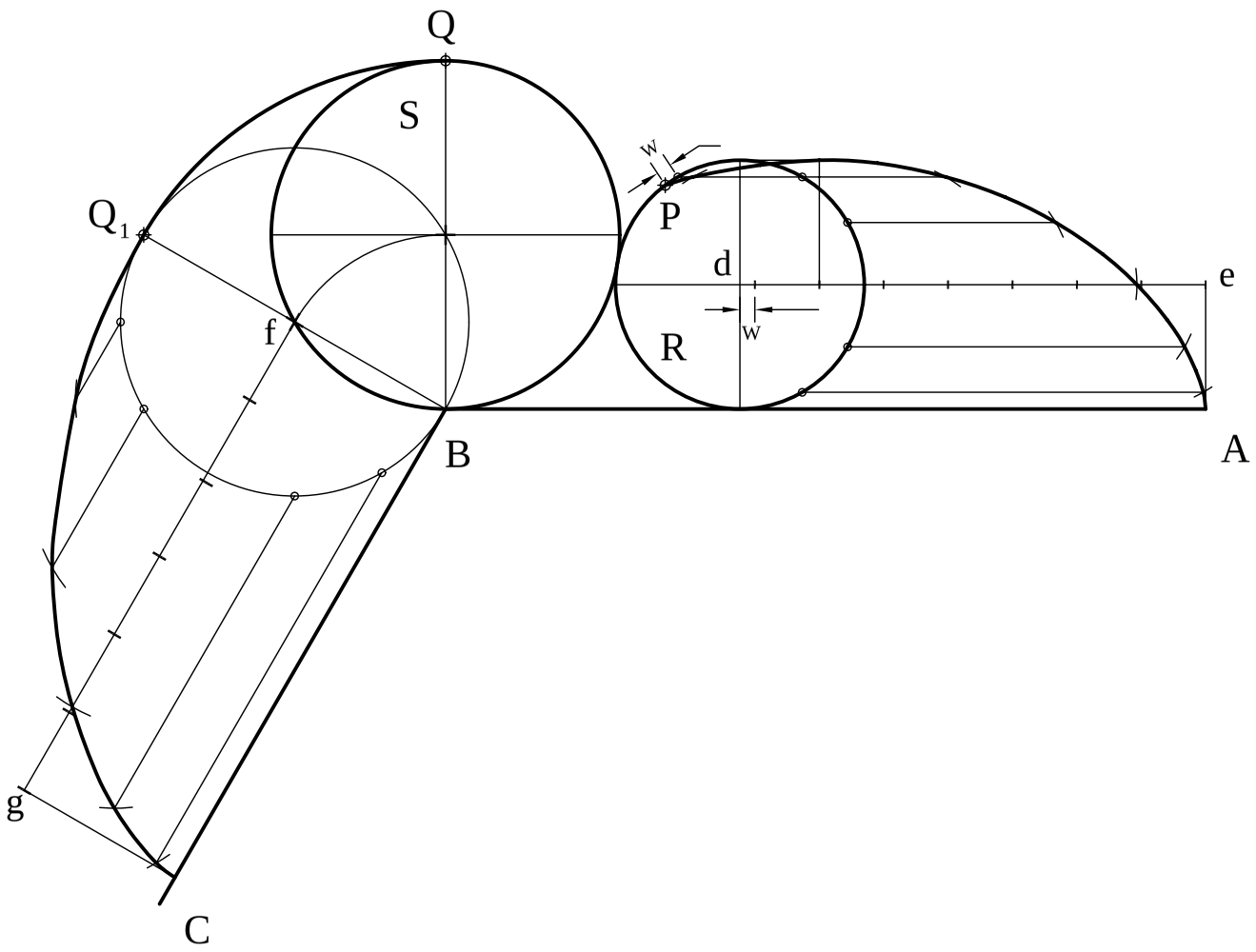

| TECHNICAL DRAWING<br>PAPER 1 ORDINARY LEVEL | |
|---|---|
| QUESTION 2 | 2006 |
| SCALE: N/A | |



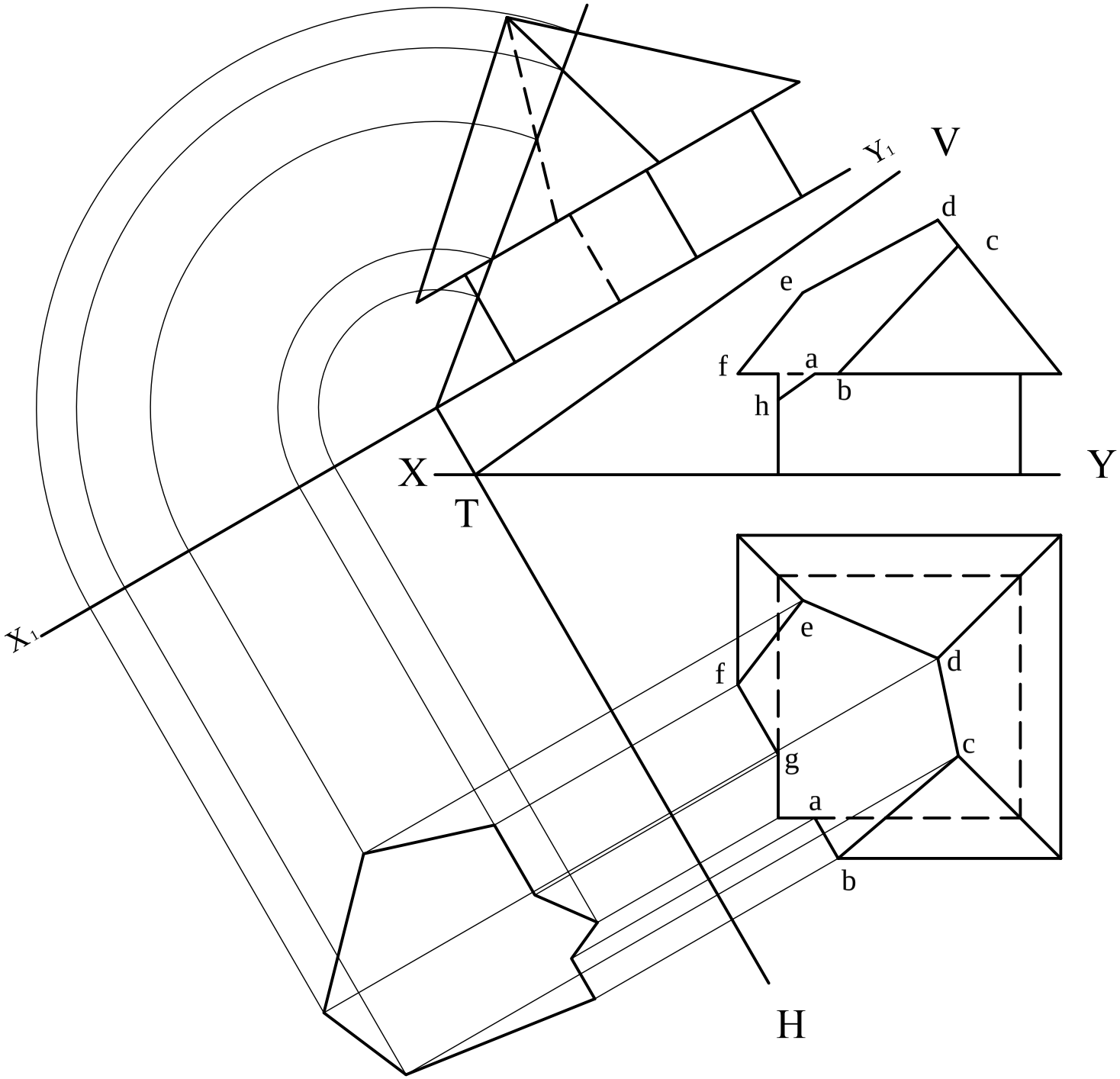

TECHNICAL DRAWING
PAPER 1 ORDINARY LEVEL

| QUESTION 3 | 2006 |
|---|---|

SCALE: N/A



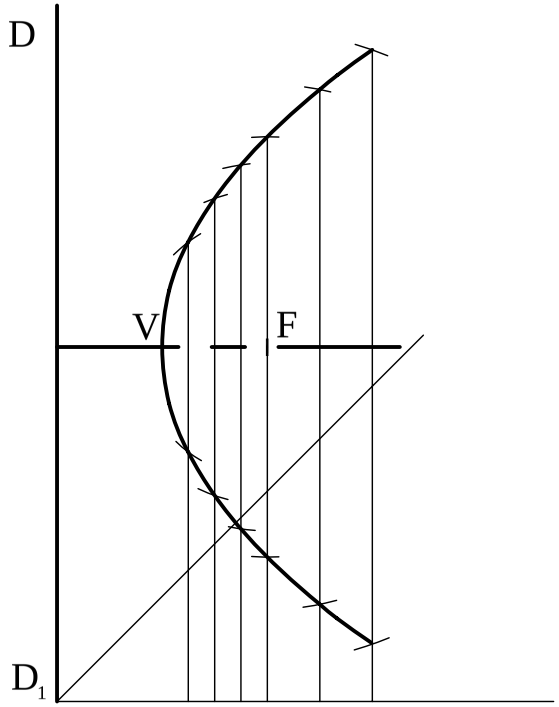

| TECHNICAL DRAWING<br>PAPER 1 ORDINARY LEVEL | |
|---|---|
| QUESTION 4 | 2006 |
| SCALE: N/A | |

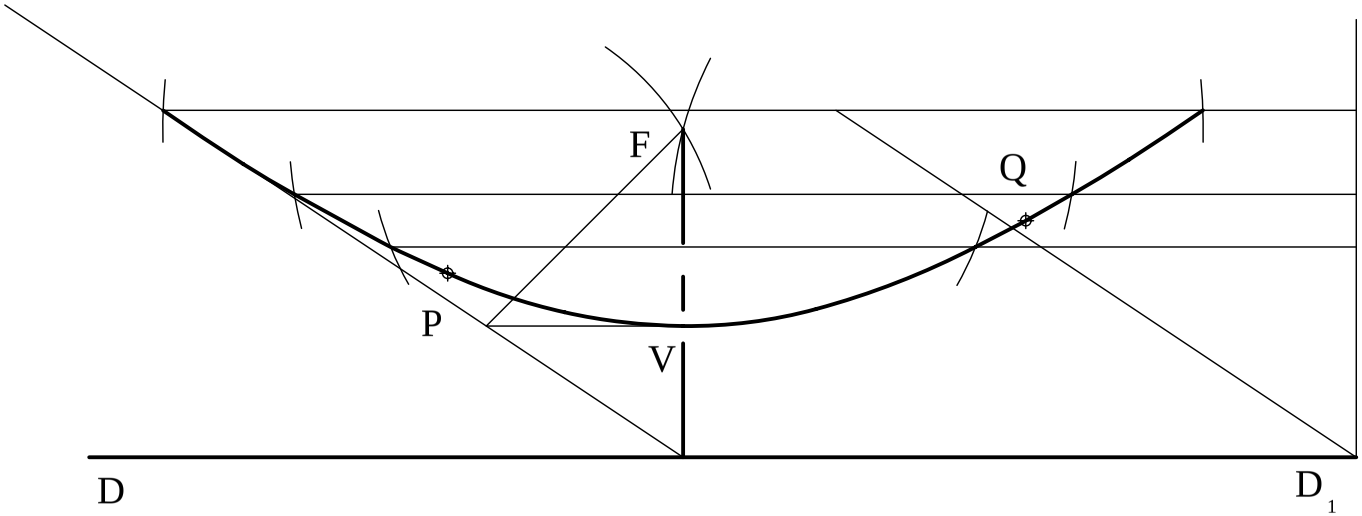



TECHNICAL DRAWING
PAPER 1 ORDINARY LEVEL

| QUESTION 5 | 2006 |
|---|---|

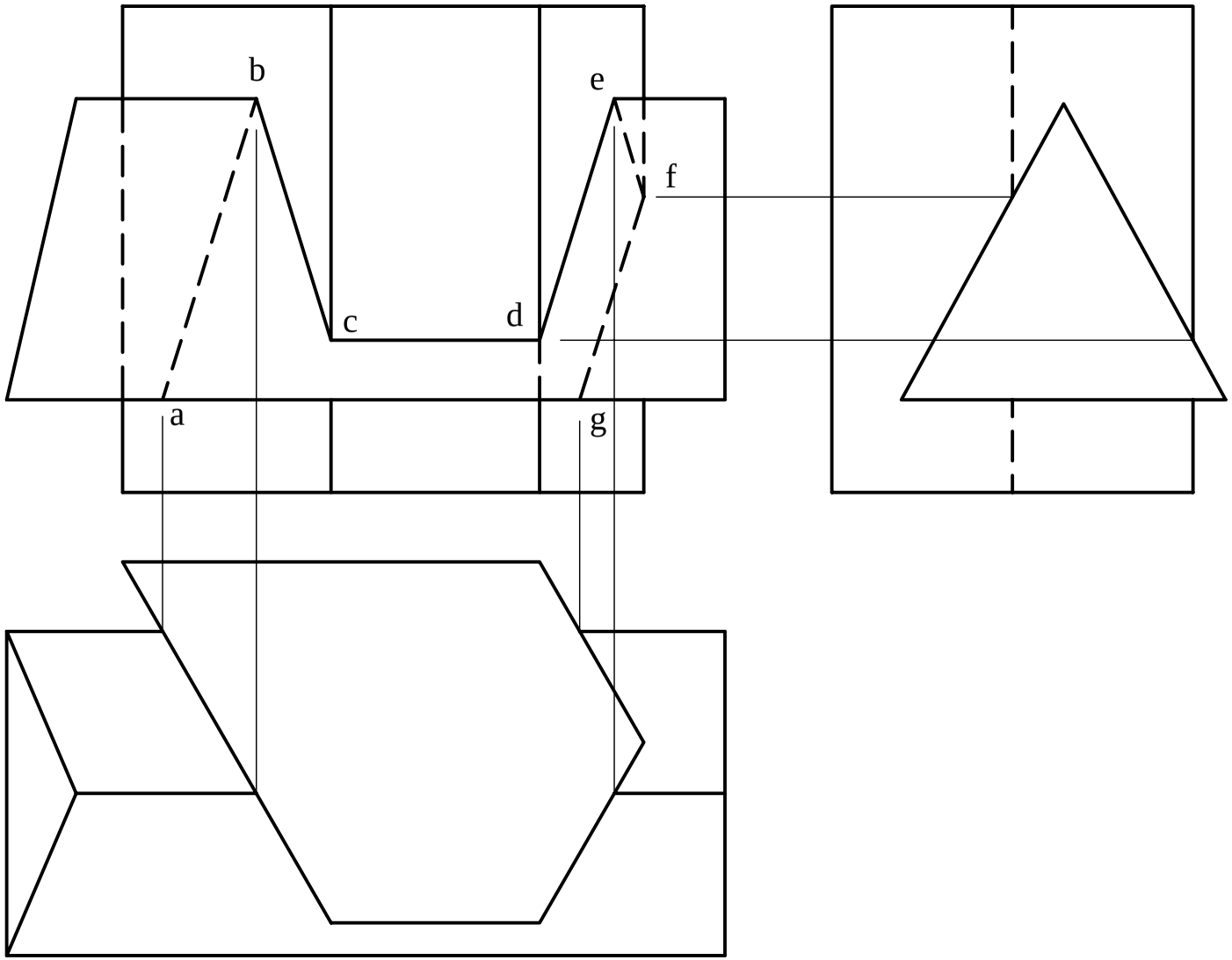
SCALE: N/A




TECHNICAL DRAWING
PAPER 1 ORDINARY LEVEL

| QUESTION 6 | 2006 |
|---|---|
| SCALE: N/A | |




TECHNICAL DRAWING
PAPER 1 ORDINARY LEVEL

| QUESTION 7 | 2006 |
|---|---|

SCALE: N/A

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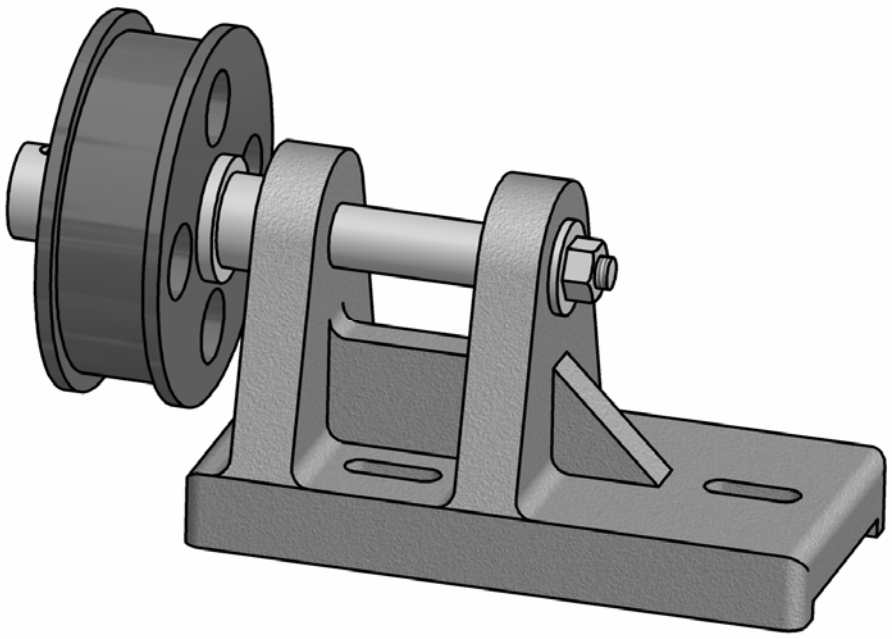
*State Examinations Commission*

*Leaving Certificate Examination 2006*

# *Technical Drawing*

## *Paper 2A - Ordinary Level*
## *(Engineering Applications)*



# *Marking Scheme and Sample Solutions*

**(Other valid solutions are acceptable and marked accordingly)**

## QUESTION 1 *(100 MARKS)*

## CONCEPTS

| | | |
|---|---|---|
| **A** | **Assembly** | **6 marks** |
| **B** | **Sectional Elevation** | **41 marks** |
| **C** | **Plan** | **27 marks** |
| **D** | **Additional Requirements** | **26 marks** |

## 1A ASSEMBLY 6 Marks

| | | |
|---|---|---|
| (i) | Spindle to Body | 1 |
| (ii) | Bushes to Pulley | 1 |
| (iii) | Assembly to Spindle | 1 |
| (iv) | Collar to Spindle | 1 |
| (v) | Grub Screw to Collar | 1 |
| (vi) | Nut and Washer to Spindle | 1 |

## 1B SECTIONAL ELEVATION 41 Marks

### 1. Body 22 Marks

| | | |
|---|---|---|
| (i) | Base | 8 |
| (ii) | Base Relief Channel | 2 |
| (iii) | Slot | 2 |
| (iv) | Vertical Supports | 4 |
| (v) | Tapered Hole | 2 |
| (vi) | Counter bored Hole | 2 |
| (vii) | Webs | 2 |

### 2. Spindle 6 Marks

| | | |
|---|---|---|
| (i) | Threaded End | 1 |
| (ii) | Centre Shaft | 1 |
| (iii) | Taper | 1 |
| (iv) | Shoulder | 1 |
| (v) | Bearing Shaft | 1 |
| (vi) | Flat End | 1 |

### 3. Pulley 5 Marks

| | | |
|---|---|---|
| (i) | Maximum Diameter | 1 |
| (ii) | Flat | 1 |
| (iii) | Lightening Holes/Boss | 1 |
| (iv) | Bore | 1 |
| (v) | Width | 1 |

### 4. Bushes **(**any one**)** 2 Marks

| | | |
|---|---|---|
| | Shoulder/Length | 2 |

**5. Collar** 2 Marks

| | | |
|---|---|---|
| (i) | Diameter | 1 |
| (ii) | Length | 1 |

**6. Grub Screw** 1 Mark

| | | |
|---|---|---|
| | Slot/Shank | 1 |

**7. Washer** 1 Mark

| | | |
|---|---|---|
| | Washer Rectangle | 1 |

**8. Hexagonal Nut** 2 Marks

| | | |
|---|---|---|
| (i) | Faces | 1 |
| (ii) | Curves | 1 |

## 1C PLAN 27 Marks

**1. Body** 12 Marks

| | | |
|---|---|---|
| (i) | Base Outline | 3 |
| (ii) | Fillets | 2 |
| (iii) | Slots | 3 |
| (iv) | Web | 2 |
| (v) | Vertical Supports | 2 |

**2. Spindle** 4 Marks

| | | |
|---|---|---|
| (i) | Thread | 1 |
| (ii) | Centre | 1 |
| (iii) | Shoulder | 1 |
| (iv) | Flat End | 1 |

**3. Pulley** 3 Marks

| | | |
|---|---|---|
| (i) | Maximum Diameter | 1 |
| (ii) | Flat Diameter | 1 |
| (iii) | Width | 1 |

**4. Bush x2** 2 Marks

| | | | |
|---|---|---|---|
| | Shoulder Rectangles | ( 2 x 1) | 2 |

**5. Collar** 2 Marks

| | | | |
|---|---|---|---|
| | Diameter / Length | 1 / 1 | 2 |

**6. Grub Screw** 1 Mark

| | | |
|---|---|---|
| | Diameter / Slot | 1 |

**7. Washer** 1 Mark

| | | |
|---|---|---|
| | Washer rectangle | 1 |

**8. Hexagonal Nut** 2 Marks

| | | | |
|---|---|---|---|
| | Faces / Curve | 1 / 1 | 2 |

## 1D ADDITIONAL REQUIREMENTS 26 Marks

| | | | |
|---|---|---|---|
| **(i)** | **First or Third Angle Projection** | 4 | 4 Marks |
| **(ii)** | **Title** | 4 | 4 Marks |
| **(iii)** | **ISO Symbol**<br>(Incorrect 2 Marks) | 4 | 4 Marks |
| **(iv)** | **Dimensioning** | 4 | 4 Marks |
| **(v)** | **Presentation** | | 10 Marks |
| | Excellent | 10 | |
| | Good | 8 | |
| | Fair | 6 | |

## Notes:

## QUESTION 2 *(50 MARKS)*

| | | |
|---|---|---|
| **A** | **Given Views** | **18 marks** |
| **B** | **Surface Development of Pipe** | **16 marks** |
| **C** | **Joint** | **8 marks** |
| **D** | **Presentation** | **8 marks** |

### 2A COMPLETED VIEWS — 18 Marks

| | | | |
|---|---|---|---|
| (i) | Baseplate Plan (Hex. / Mid. / Semicircle / Screw Holes) | (2/1/1/1) | 5 |
| (ii) | Elliptical Hole in Baseplate (Semicircle Div. / Proj. / Outline) | (3/1/1) | 5 |
| (iii) | Pipe End Elliptical | (1/1/1) | 3 |
| (iv) | Pipe Outline | | 1 |
| (v) | Elevation | | 4 |

### 2B SURFACE DEVELOPMENT OF PIPE — 16 Marks

| | | |
|---|---|---|
| (i) | Seam on CC (Any seam 2 marks) | 4 |
| (ii) | Stepping off of Circumference | 4 |
| (iii) | Length of Generators | 4 |
| (iv) | Outline of Top Curve | 2 |
| (v) | Outline of Base Curve | 2 |

### 2C JOINT — 8 Marks

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

### 2D PRESENTATION — 8 Marks

| | |
|---|---|
| Excellent | 8 |
| Good | 6 |
| Fair | 4 |

**Note: Indexing to be considered under this heading**

## Notes:

## QUESTION 3 *(50 MARKS)*

**3A Cam Profile** **30 Marks**
**3B Mechanism** **20 Marks**

## 3A CAM PROFILE 30 Marks

**(a) Displacement Diagram** **10 Marks**
**(b) Cam Profile** **15 Marks**
**(c) Presentation** **5 Marks**

### (a) Displacement Diagram 10 Marks

| | | |
|---|---|---|
| (i) | 360° Divisions | 1 |
| (ii) | Lift/Travel | 2 |
| (iii) | 0° to 180° Uniform Acc. & Ret. | 2 |
| (iv) | 180° to 210° Dwell | 1 |
| (v) | 210° to 300° Simple Harmonic Motion | 2 |
| (vi) | 270° to 360° Uniform Velocity | 1 |
| (vii) | Drawing of Curve | 1 |

### (b) Cam Profile 15 Marks

| | | |
|---|---|---|
| (i) | Minimum Radius | 2 |
| (ii) | Camshaft Diameter | 1 |
| (iii) | Maximum Radius | 1 |
| (iv) | 0° to 180° Uniform Acc. & Ret. | 2 |
| (v) | 180° to 210° Dwell | 2 |
| (vi) | 210° to 300° Simple Harmonic Motion | 2 |
| (vii) | 270° to 360° Uniform Velocity | 2 |
| (viii) | Direction of Rotation | 2 |
| (ix) | Drawing Profile | 1 |

### (c) Presentation 5 Marks

| | |
|---|---|
| Excellent | 5 |
| Good | 4 |
| Fair | 3 |

**Note:** Indexing to be considered under this heading

Notes:

## 3B MECHANISM 20 Marks

**(a) Line Diagram 4 Marks**
**(b) Locus of F 10 Marks**
**(c) Machine Guard 3 Marks**
**(d) Presentation 3 Marks**

### (a) Line Diagram 4 Marks

| | | |
|---|---|---|
| (i) | Crank AB | 1 |
| (ii) | Crank CD | 1 |
| (iii) | Link BE | 1 |
| (iv) | Arm EF | 1 |

### (b) Locus of F 10 Marks

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

### (c) Machine Guard 3 Marks

| | | |
|---|---|---|
| (i) | Minimum Clearance | 1 |
| (ii) | Drawing of Guard Outline | 2 |

### (d) Presentation 3 Marks

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

**Note:** Indexing to be considered under this heading

Notes:

## QUESTION 4 *(50 MARKS)*

| | | |
|---|---|---|
| **4A** | **Dimensional Drawing** | **32 Marks** |
| **4B** | **Machine Part** | **12 Marks** |
| **4C** | **Engineering Terms** | **6 Marks** |

## 4A DIMENSIONAL DRAWING 32 Marks

| | | |
|---|---|---|
| **(a)** | **Shape Description** | **18 Marks** |
| **(b)** | **Size Description** | **12 Marks** |
| **(c)** | **Presentation** | **2 Marks** |

### (a) Shape Description 18 Marks

| | | |
|---|---|---|
| (i) | Square Shaft | 2 |
| (ii) | Diameter / Length | 2 |
| (iii) | Under Cut | 2 |
| (iv) | Diameter / Length | 2 |
| (v) | Chamfers | 2 |
| (vi) | Fillet | 1 |
| (vii) | Diameter / Length | 1 |
| (viii) | Taper Maximum Diameter | 1 |
| (ix) | Taper Minimum Diameter | 1 |
| (x) | Taper Length | 1 |
| (xi) | Diameter / Length | 1 |
| (xii) | Thread Convention | 1 |
| (xiii) | Dome | 1 |

### (b) Size Description 12 Marks

| | | |
|---|---|---|
| (i) | Diameters x 4 | 2 |
| (ii) | Lengths x 8 | 2 |
| (iii) | Square | 2 |
| (iv) | Under Cut | 1 |
| (v) | Chamfer | 2 |
| (vi) | Fillet Radius | 1 |
| (vii) | Screw Thread Designation | 2 |

### (c) Presentation 2 Marks

| | | |
|---|---|---|
| (i) | Centre Line | 1 |
| (ii) | Dimensions | 1 |

Notes:

## 4B MACHINE PART — 12 Marks

**(a) Parts List — 6 Marks**
**(b) Relief Valve Operation — 3 Marks**
**(c) Relief Valve Regulation — 3 Marks**

**(a) Parts List — 6 Marks**

| | | |
|---|---|---|
| (i) | Table | 1 |
| (ii) | Item Number / Name | 5 |

**(b) Relief Valve Operation — 3 Marks**

| | | |
|---|---|---|
| (i) | Description | 2 |
| (ii) | Sketch | 1 |

**(c) Relief Valve Regulation — 3 Marks**

| | | |
|---|---|---|
| (i) | Description | 2 |
| (ii) | Sketch | 1 |

## 4C ENGINEERING TERMS — 6 Marks

| | | |
|---|---|---|
| (i) | Flanged elbow | 2 |
| (ii) | Rolled steel channel | 2 |
| (iii) | Butterfly valve | 2 |

Notes:

## QUESTION 5 SECTION A *(50 Marks)*

## 5A ISOMETRIC VIEW 50 Marks

**(a) Correct View 4 Marks**
**(b) Sectioned View 15 Marks**
**(c) Un-Sectioned View 26 Marks**
**(d) Presentation 5 Marks**

### (a) Correct View 4 Marks

| | | |
|---|---|---|
| (i) | Correct View Point P | 4 |
| | Oblique (2 Marks) | |

### (b) Sectioned View 15 Marks

| | | |
|---|---|---|
| (i) | Hole LHS | 3 |
| (ii) | Outer Diameter | 2 |
| (iii) | Left Portion | 3 |
| (iv) | Top Right | 2 |
| (v) | Vertical Right | 3 |
| (vi) | Groove | 2 |

### (c) Un-Sectioned View 26 Marks

| | | |
|---|---|---|
| (i) | Construction Large Diameter | 2 |
| (ii) | Construction Small Diameter | 2 |
| (iii) | Construction Web | 2 |
| (iv) | Curved Surface LHS | 2 |
| (v) | Inner Curve | 2 |
| (vi) | Outer Curve | 2 |
| (vii) | Hole Bottom | 1 |
| (viii) | Left Vertical Body | 2 |
| (ix) | Top Surface | 2 |
| (x) | Square Hole Portion | 3 |
| (xi) | Web | 2 |
| (xii) | Inner Surface RHS | 2 |
| (xiii) | Groove | 2 |

### (d) Presentation 5 Marks

| | |
|---|---|
| Excellent | 5 |
| Good | 4 |
| Fair | 3 |

## Notes:

## QUESTION 5 SECTION B *(50 Marks)*

**5(a) Six Commands** **6 Marks**

| | | |
|---|---|---|
| 6 x 1 | | 6 |

**5(b) Three Commands Explanation** **9 Marks**

| | | |
|---|---|---|
| Sketch | 2 | 3 x 3 |
| Note | 1 | |

**5(c) Wire Frame Representation** **10 Marks**

| | | |
|---|---|---|
| (i) | View as given | 2 |
| (ii) | Left Block | 2 |
| (iii) | Main Block | 2 |
| (iv) | Top Curve | 2 |
| (v) | Triangukar Wedge | 2 |

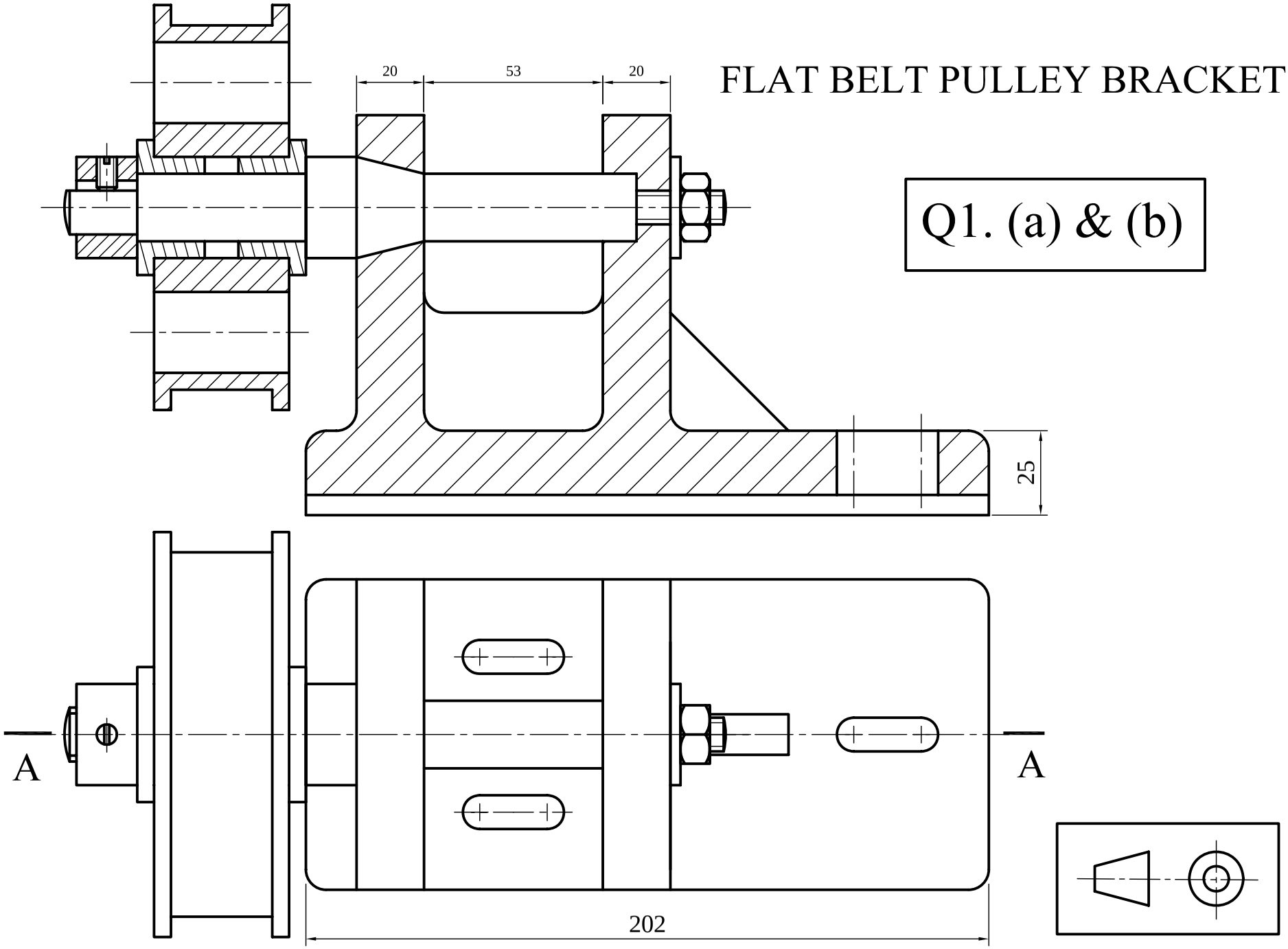
**5(d) Cad Profile** **25 Marks**

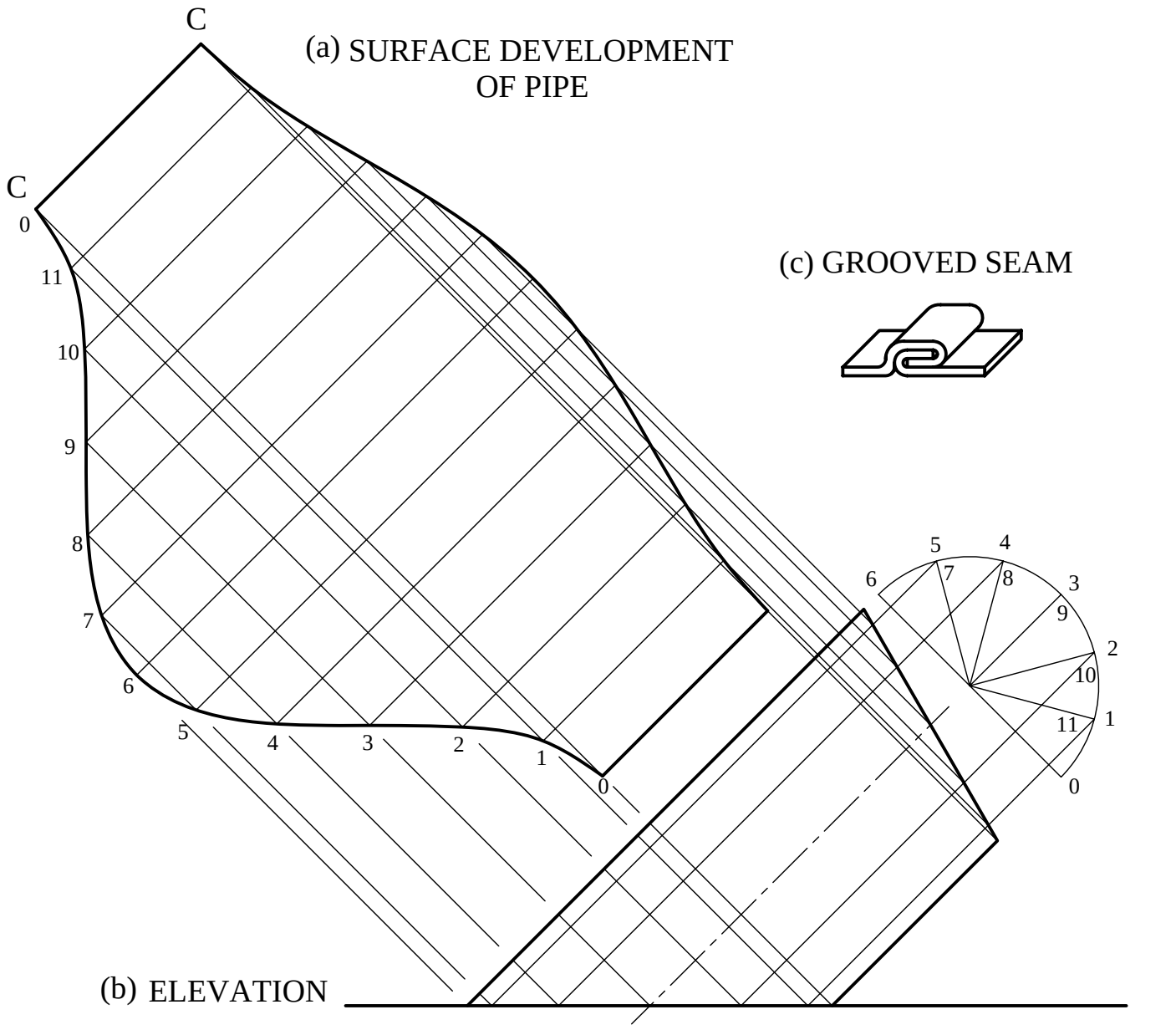
| | | |
|---|---|---|
| (i) | 5 Lines 5 x 1 | 5 |
| (ii) | Lines BC and CD | 4 |
| (iii) | Fillet | 1 |
| (iv) | Polyline KL | 1 |
| (v) | Mirror Image | 4 |
| (vi) | Circle ϕ140 | 2 |
| (vii) | Small Button Rectangle | 2 |
| (viii) | Rectangular Array | 2 |
| (ix) | Large Rectangle | 2 |
| (x) | Presentation | 2 |

Notes:

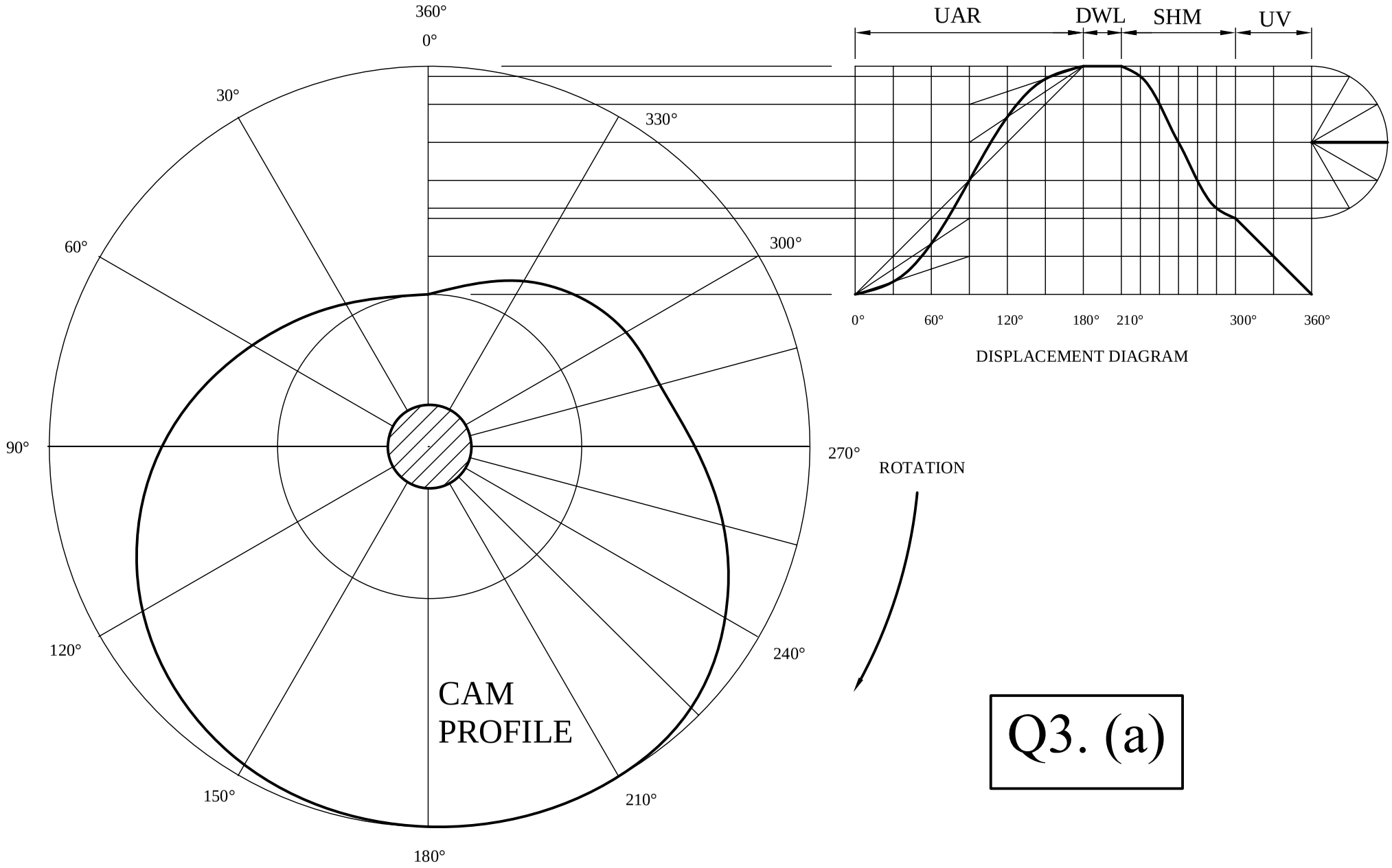
# FLAT BELT PULLEY BRACKET

Q1. (a) & (b)

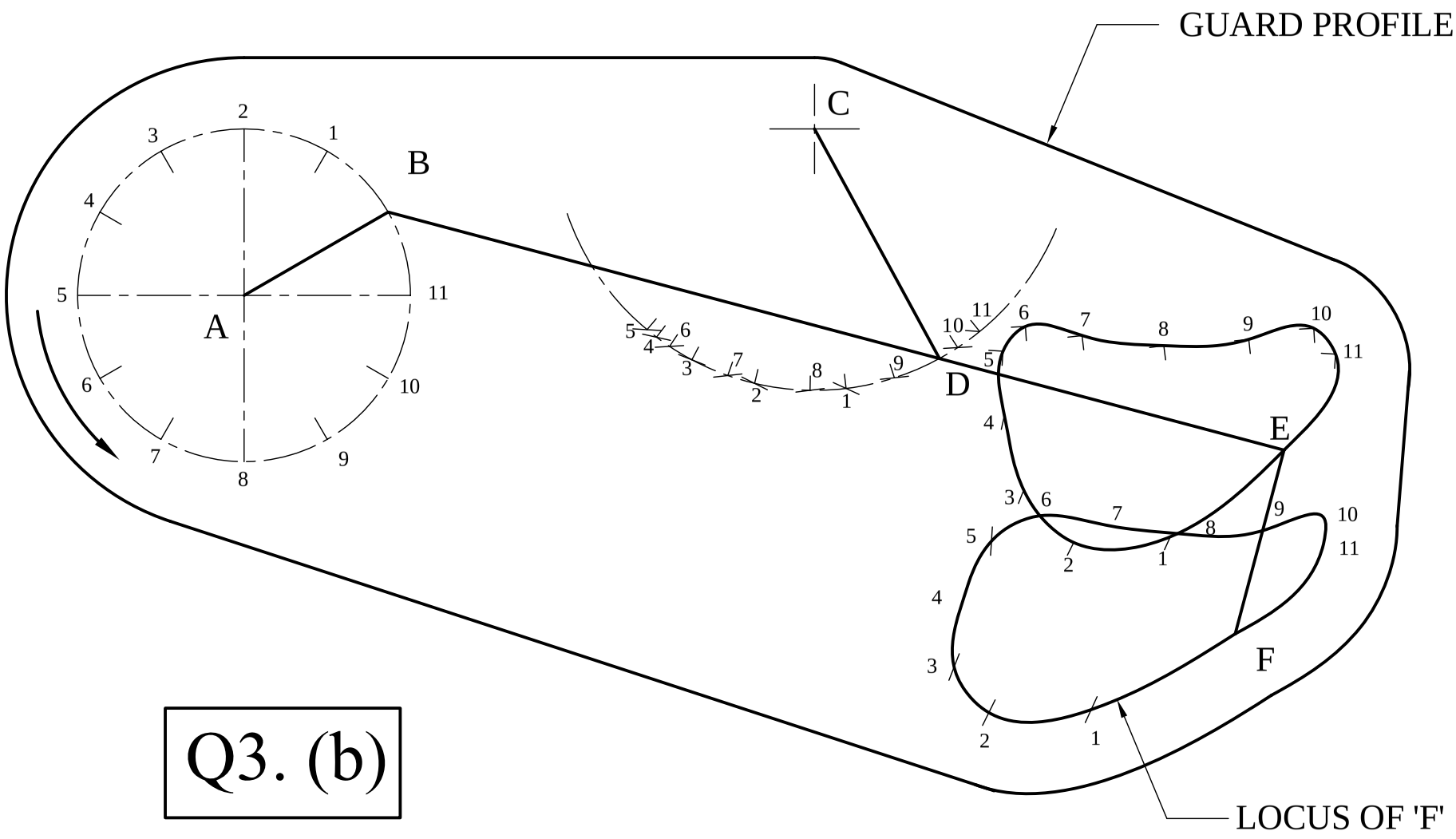



C
(a) SURFACE DEVELOPMENT
OF PIPE
C
0
11
10
9
8
7
6
5
4
3
2
1
0
(c) GROOVED SEAM
5
4
6
7
8
3
9
2
10
1
11
0
(b) ELEVATION
AND
PLAN

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

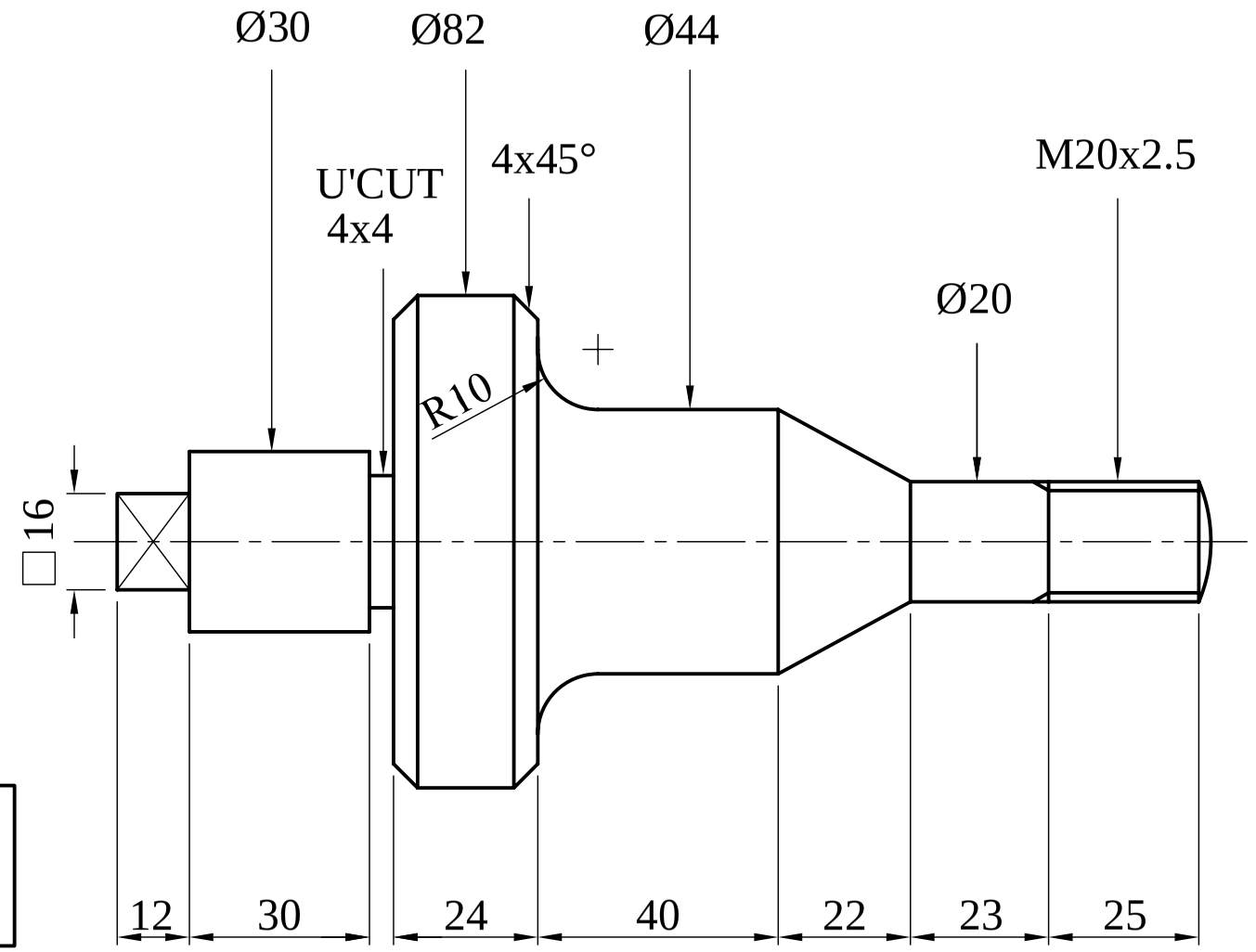

360°
0°
30°
330°
60°
300°
90°
270°
120°
240°
150°
210°
180°
CAM
PROFILE
ROTATION
UAR
DWL
SHM
UV
0°
60°
120°
180°
210°
300°
360°
DISPLACEMENT DIAGRAM

# Q3. (a)




Q3. (b)

(a)




Q4. (a)

# Q4. (b), (c)

(b)

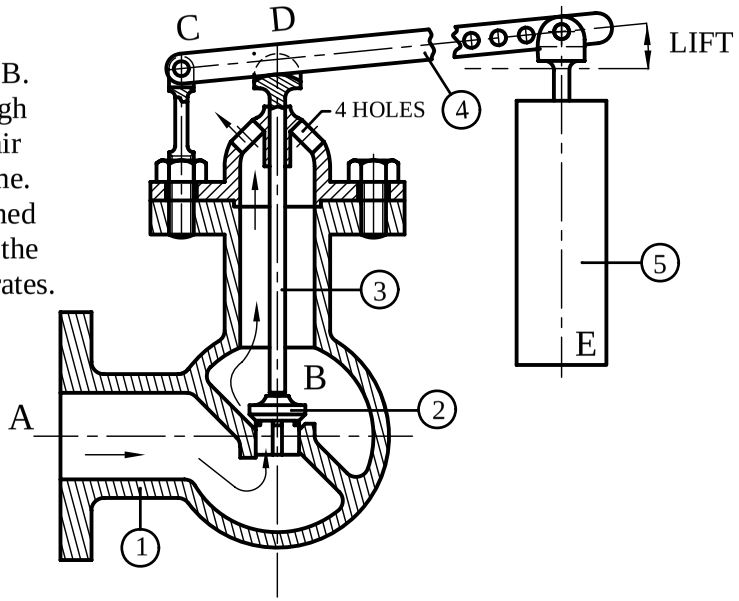
(i)

| NUMBER | NAME |
|---|---|
| 1 | BODY |
| 2 | VALVE |
| 3 | SPINDLE |
| 4 | LEVER |
| 5 | WEIGHT |

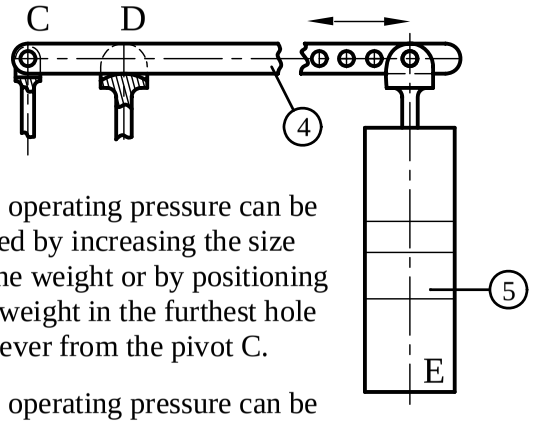
(ii)

Pressure builds from A to valve B. When the pressure is large enough it lifts the valve and allows the air to escape through 4 holes in dome. The lever pivots at C and is pushed up at D. The weight E regulates the pressure at which the valve operates.

Once the pressure is relieved the valve is forced down by the downward force from the lever and weight. It stays in the closed position until the pressure again rises and the cycle begins again.



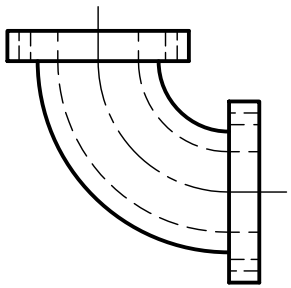

(iii)



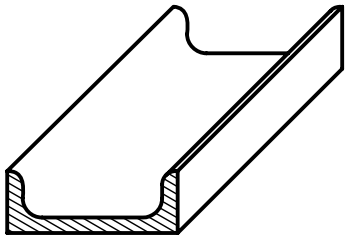

The operating pressure can be raised by increasing the size of the weight or by positioning the weight in the furthest hole on lever from the pivot C.

The operating pressure can be lowered by decreasing the size of the weight or by positioning the weight in a hole nearer the pivot C as indicated in sketch.

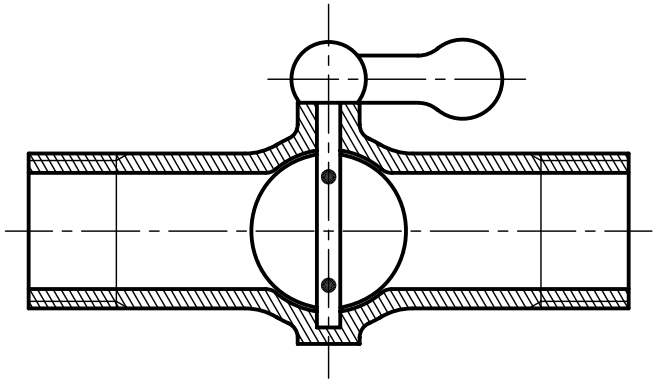
(c)



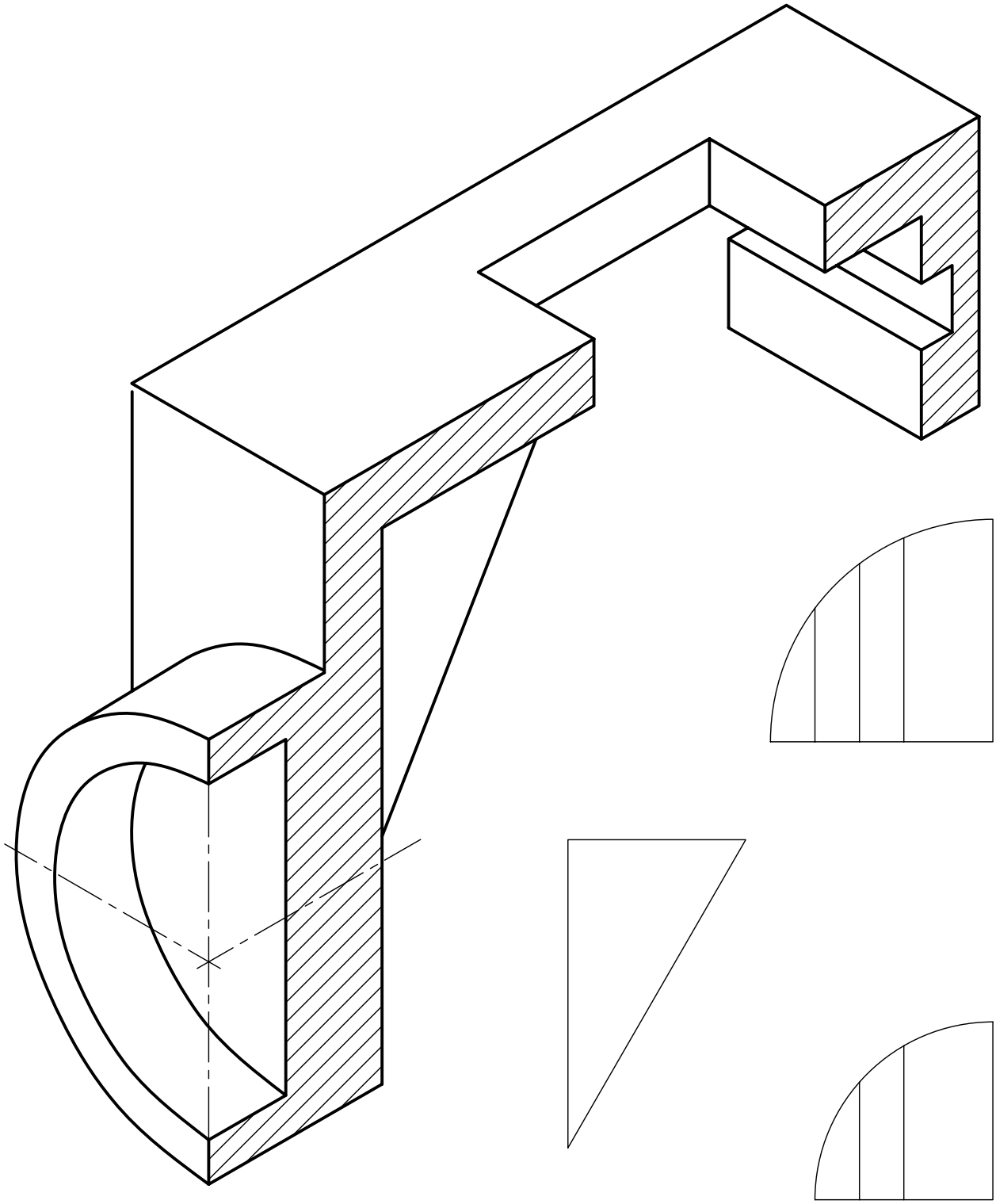
(i) FLANGED ELBOW



(ii) ROLLED STEEL CHANNEL



(iii) BUTTERFLY VALVE



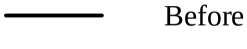

Q5. SECTION A

(a) Six Computer Aided Drawing commands: line, offset, fillet, circle, trim, hatch etc.

(b)

(i) LENGTHEN

This command changes the length of lines and the included angle of arcs. The modification can be positive or negative.




(ii) PAN

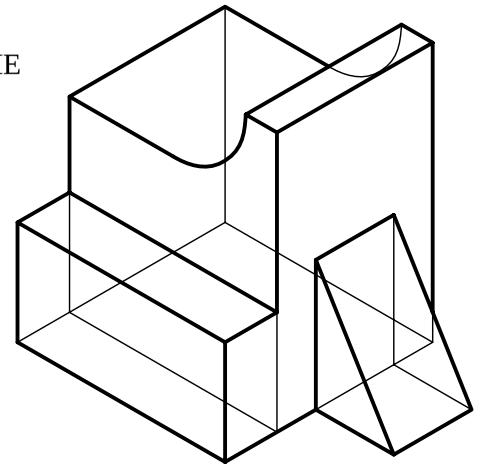
This command moves the drawing display in the current viewport.


(iii) ZOOM

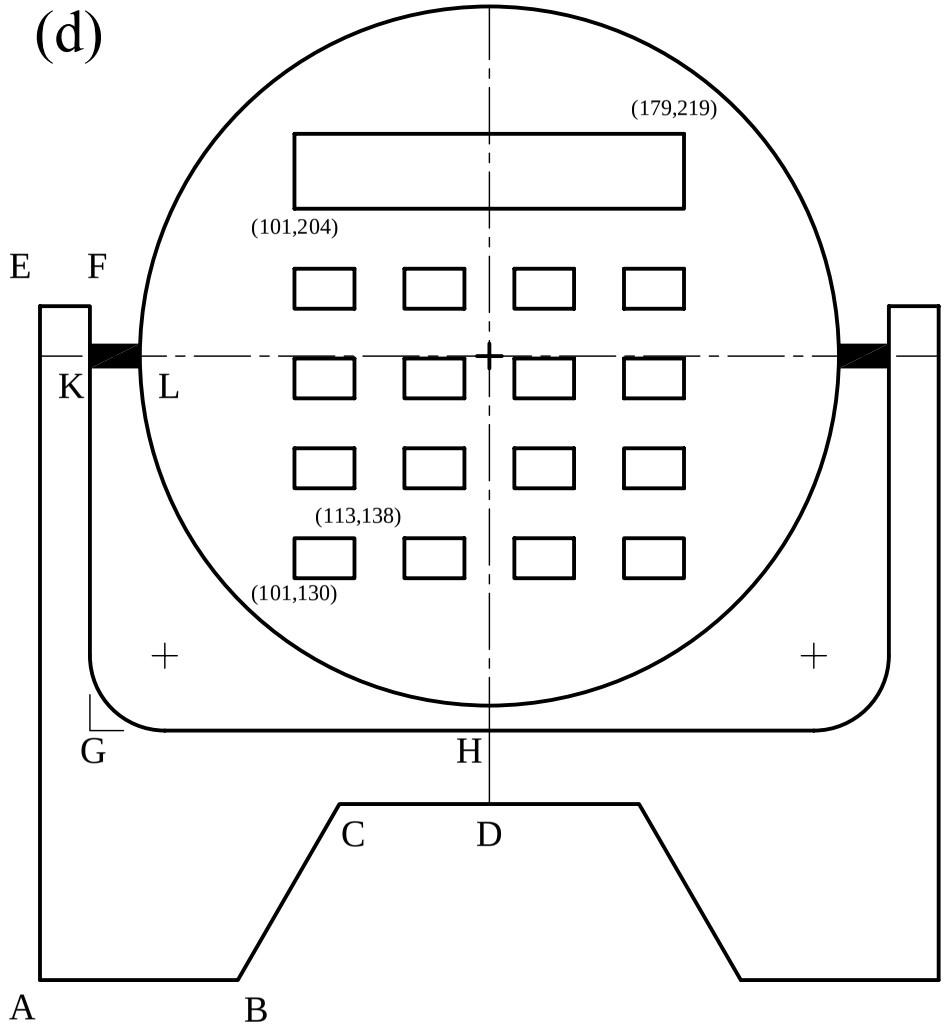
This command increases or decreases the apparent size of objects in the current viewport.


(c)

WIREFRAME



(d)




Q5. (a), (b), (c), (d) SECTION B

**Coimisiún na Scrúduithe Stáit**
***State Examinations Commission***

***Leaving Certificate Examination 2006***

# *Technical Drawing*

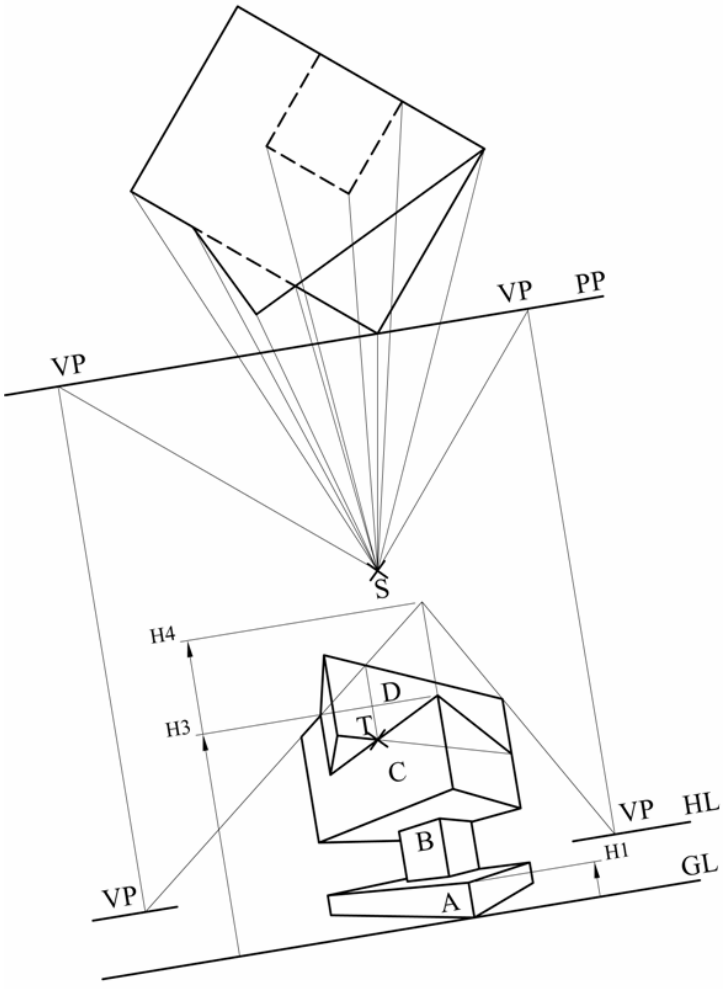
## *Paper II(B) – Ordinary Level (Building Applications)*

***(200 Marks)***

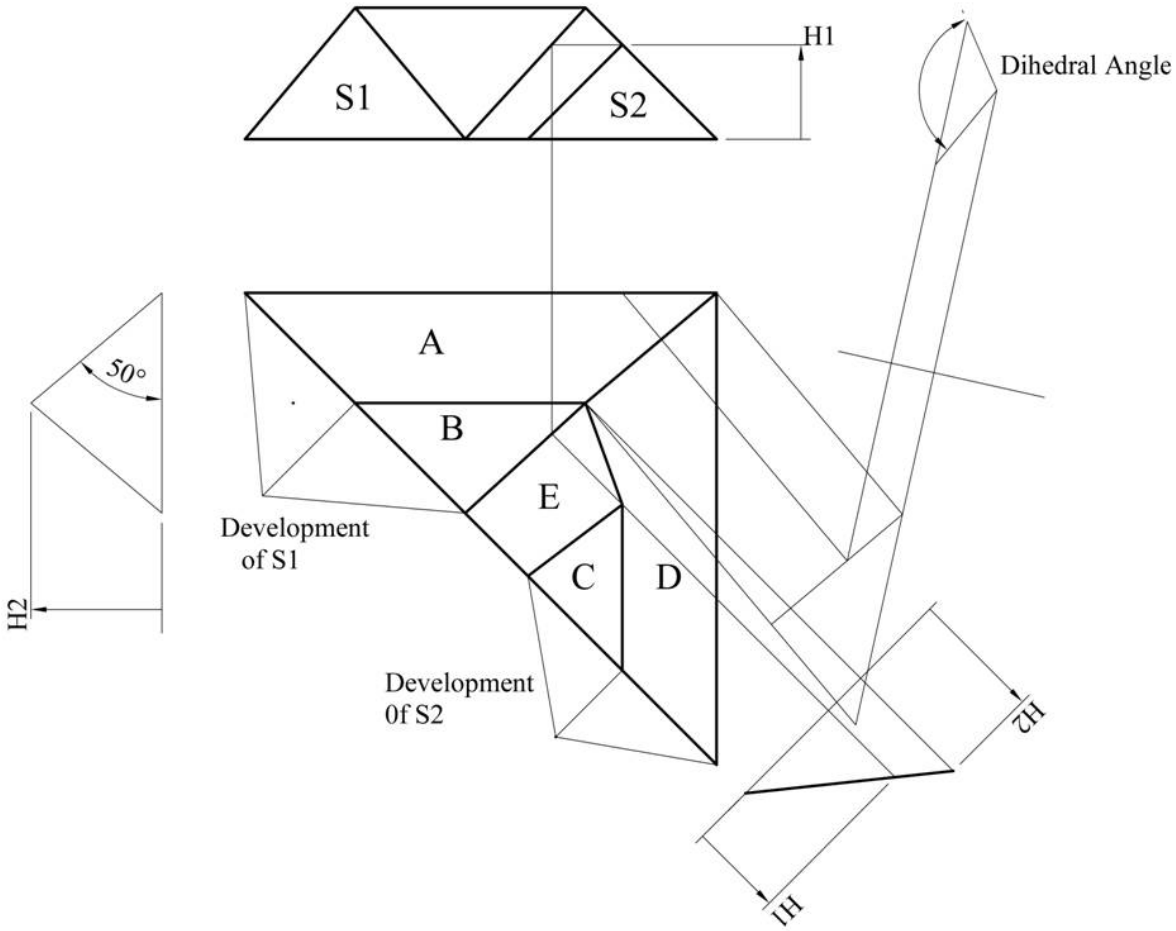
## *Marking Scheme & Solutions*

(Other valid solutions are acceptable and marked accordingly)

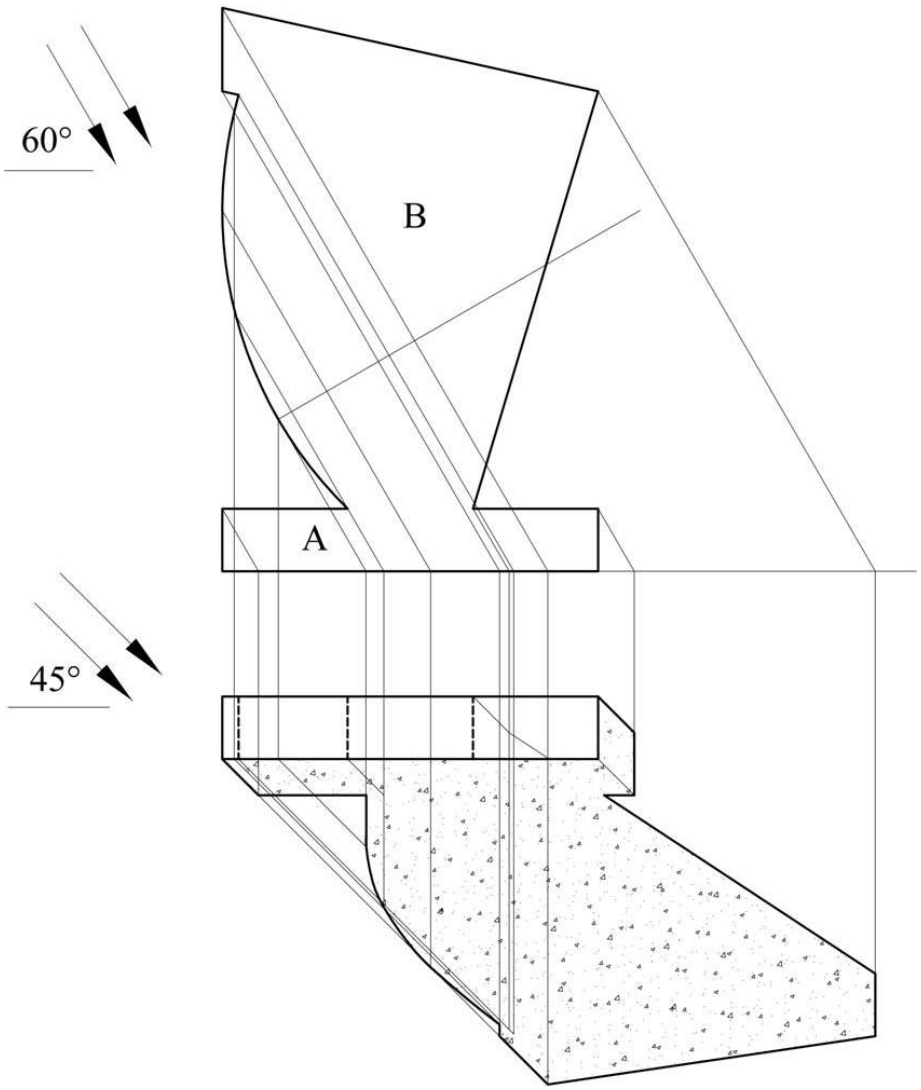
| | QUESTION 1 | Marks |
|---|---|---|
| 1) | Draw the given plan (any 4 lines) | 4 |
| 2) | Position spectator, P.P., V.P.1 and V.P.2 in plan. (1,2,2)<br>(*Any spectator 1, Any PP 2, -1 if V. points wrong.)* | 5 |
| 3) | Ground line, horizon line and V.P.'s in elevation. (1,1,2)<br>(-1 for incorrect projection) | 4 |
| 4) | Projection lines from S to plan<br>(Any one line) | 2 |
| 5) | Perspective of base lines of block A. (1,1,1) | 3 |
| 6) | Apply $H_1$ for block A Complete block A (1,2,4)<br>*(-1 if sketched)* | 7 |
| 7) | Establish base of block B (1,1,1) | 3 |
| 8) | Establish Ht, and complete block B. (1,4,1,1) | 7 |
| 9) | Establish base of block C. (1,1,1,1) | 4 |
| 10) | Apply $H_3$, $H_4$ and complete block C. (1,1,1) | 3 |
| 11) | Establish point T, and complete block D. (1,2)<br>*(2 for any two lines on block D)* | 3 |
| 12) | Presentation | 5 |
| | **Total** | **50** |



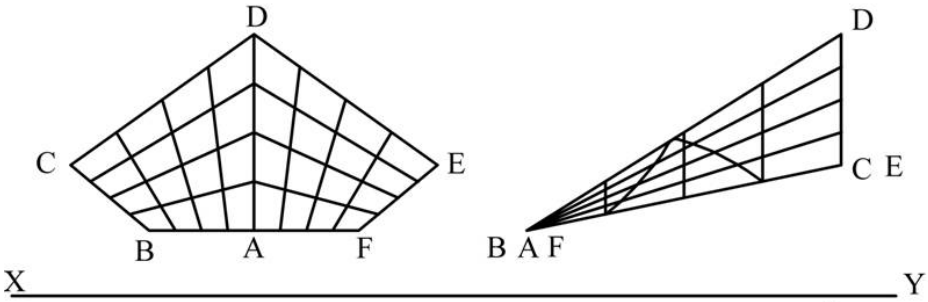
| | QUESTION 2 | Marks |
|---|---|---|
| 1) | Draw roof perimeter in plan. | 3 |
| 2) | Draw edge view of surfaces C and D in elevation | 3 |
| 3) | Edge view of surfaces A and B. | 3 |
| 4) | Apply $H_2$, and complete elevation. (1,5) | 6 |
| 5) | Establish line of intersection between surfaces C and E | 5 |
| 6) | Complete plan. | 6 |
| 7) | **Development of surfaces S1 and S2**<br>Determine true lengths, and draw developments. (2,2,2,2) | 8 |
| 8) | **Dihedral angle between A and D**<br>True length of line of intersection. (1x4) | 4 |
| 9) | Construction to determine dihedral angle. (1x6) | 6 |
| 10) | Dihedral angle between surfaces A and D | 1 |
| 11) | Presentation | 5 |
| | **Total** | **50** |

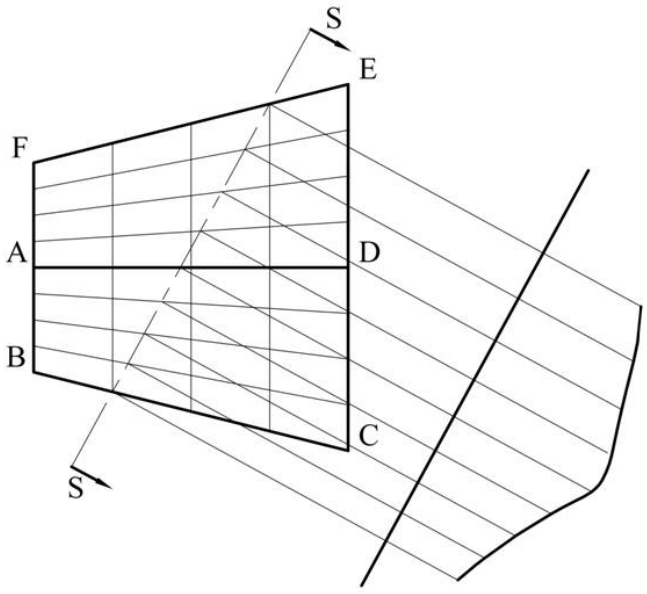


| QUESTION 3 | | | Marks |
|---|---|---|---|
| 1) | Draw the given plan and elevation | (4,4) | 8 |
| 2) | Lines at appropriate angles in plan and elevation | (2,2) | 4 |
| 3) | Determine shadow cast by block A | (1x8) | 8 |
| 4) | **Determine shadow cast by curved surface of block B.**<br>Locating any three points on curve in plan, and draw curve. (2 for any curve) | (2,2,2,2) | 8 |
| 5) | Shadow cast by lines of separation of curve in plan. | (1,1) | 2 |
| 6) | Shadow cast by vertical, and horizontal lines of block B. | (5,5) | 10 |
| 7) | Shadow cast by sloped lines in plan. | (2,1,1) | 4 |
| 8) | Identify shadow cast. | | 1 |
| 9) | Presentation | | 5 |
| | | **Total** | **50** |

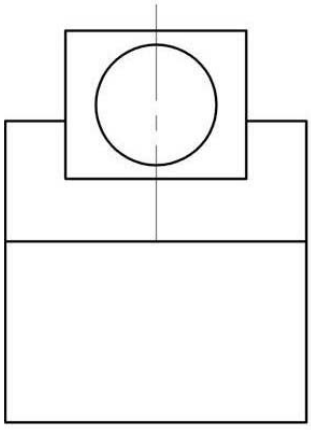


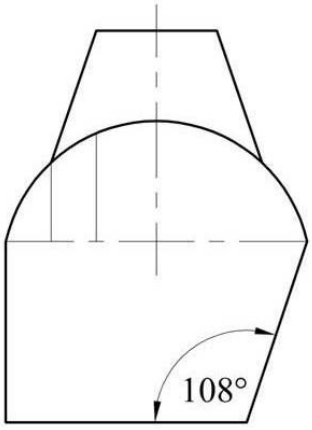
| | | | Marks |
|---|---|---|---|
| | **QUESTION 4** | | |
| 1) | **Plan and elevation**<br>Draw the given plan, including the elements. | (4,2,2) | 8 |
| 2) | Project outline elevation and measure heights. | (2,3) | 5 |
| 3) | Draw outline elevation. | (1x3) | 3 |
| 4) | Draw elements in elevation. | (2,2) | 4 |
| 5) | **True shape of section**<br>Use of line SS or XY line parallel to SS | | 1 |
| 6) | Project intersections from plan | (2,3) | 5 |
| 7) | Measure heights | (1,5) | 6 |
| 8) | Draw the true shape<br>*(Any curve)* | | 1 |
| 9) | **End Elevation**<br>Determine height and width of end elevation. | (1,1) | 2 |
| 10) | Draw outline of end elevation. | (1x5) | 5 |
| 11) | Complete end elevation | (1,2,2) | 5 |
| 12) | Presentation | | 5 |
| | | **Total** | **50** |

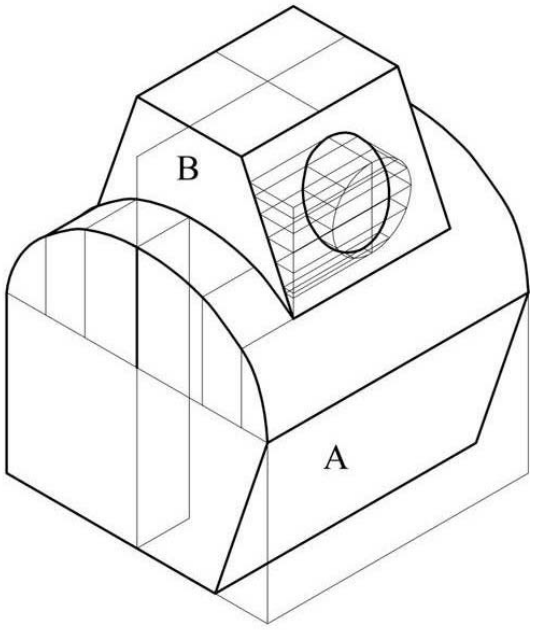


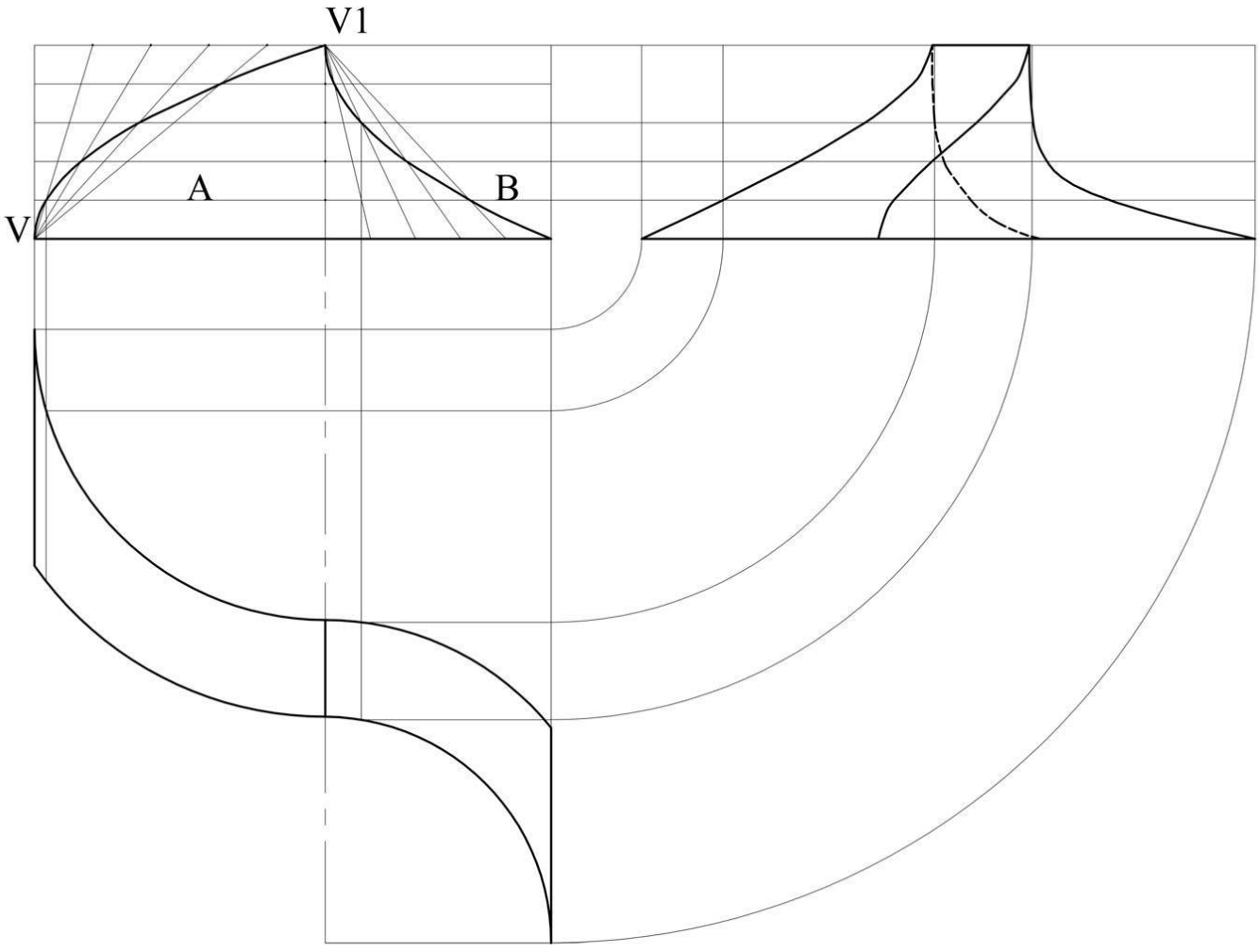
| QUESTION 5 | | | Marks |
|---|---|---|---|
| 1) | Draw the given views | (4,4) | 8 |
| 2) | Isometric axis | (1,1,1) | 3 |
| 3) | Base of block A in isometric. | (3,2) | 5 |
| 4) | Flat surfaces of block A in isometric. | (3,4) | 7 |
| 5) | Grid on curve of block A in orthographic and isometric. *(Any three ordinates)* | (3,3) | 6 |
| 6) | Draw end curves on block A in isometric. | (1,2,1) | 4 |
| 7) | Cage for block B in isometric. | | 4 |
| 8) | Outline of block B in isometric. | | 3 |
| 9) | Curve of intersection. | (1,1) | 2 |
| 10) | Grid for circular hole in isometric, and draw curve. | (1,1,1) | 3 |
| 11) | Presentation | | 5 |
| | | **Total** | **50** |





| QUESTION 6 | | | Marks |
|---|---|---|---|
| 1) | Draw centre line and set up centers in plan | (2,1,1) | 4 |
| 2) | Curves in plan | (1x4) | 4 |
| 3) | Draw outline elevation | | 4 |
| 4) | Construction for semi parabola A in elevation | | 5 |
| 5) | Construction for semi parabola B in elevation | | 5 |
| 6) | Draw semi parabolic curves in elevation | (3,3) | 6 |
| 7) | Project outline end elevation | | 4 |
| 8) | Project of any two additional points to end elevation | (4,4) | 8 |
| 9) | Complete end elevation | (2,2,1) | 5 |
| 10) | Presentation | | 5 |
| | | **Total** | **50** |



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