

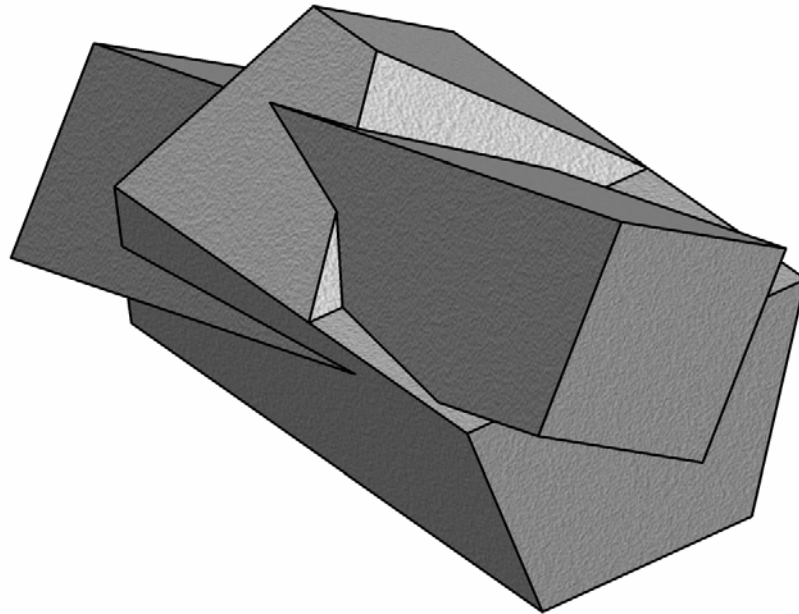


**Coimisiún na Scrúduithe Stáit**  
*State Examinations Commission*

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*Leaving Certificate Examination 2006*

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



***Marking Scheme***  
***and Sample Solutions***

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

**QUESTION 1****MARKS****Plan and Elevation of planes ABC and ADE**

- (i) Interpretation of co-ordinates ..... 2
- (ii) Drawing outline of planes ..... 2

**(a) Line of Intersection**

- (iii) Horizontal line in elevation (or line parallel to V.P.)..... 2
- (iv) Projections in plan (or elevation) ..... 2
- (v) Drawing line of intersection in plan and elevation ..... 2

*or*

- (iii) Edge view of one plane in auxiliary view...(1,1) ..... 2
- (iv) Projection of other plane ..... 2
- (v) Determining projections of line of intersection..... 2

**(b) Dihedral angle**

- (i) New  $X_1Y_1$  taken parallel to line of intersection ..... 5
- (ii) Projection of ABC and ADE on new  $X_1Y_1$  ..... 4
- (iii) New  $X_2Y_2$  taken perpendicular to line of intersection ..... 5
- (iv) Projection of ABC and ADE on  $X_2Y_2$  and indicating dihedral angle.. 5

**(c) Determining line from A**

- (i) Determining true shape of plane ADE ..... 3
- (ii) Drawing line from A at  $70^\circ$  to DE in a view  
showing plane ADE as a true shape ..... 3
- (iii) Drawing correct required line in plan and elevation...(2,1) .....3

**(d) Skew lines**

- (i) Drawing skew lines AB and DE..... 3
- (ii) Finding edge view of parallel planes..... 3
- (iii) Location of shortest distance..... 3
- (iv) Projecting or measuring to plan and elevation ..... 3

**Total** **50**

**QUESTION 2****MARKS****(a) Drawing given figure**

- (i) Drawing square of side 120mm..... 2
- (ii) Constructing equivalent rectangle with one side 75mm...(2,1,2)..... 5
- (iii) Drawing line EAC ..... 3
- (iv) Location of point O and drawing of circle ..... 3
- (v) Location of point D ..... 2
- (vi) Location of point B..... 4
- (vii) Completion of quadrilateral ABCD ..... 4

**(b) Division of Area**

- (i) Joining DO..... 1
- (ii) Conversion of ABCD into triangle leaving  
point D and line AB intact...(Any = 1) ..... 3
- (iii) Bisection of base ..... 3
- (iv) Joining O to division point and drawing parallel from D...(1,2) ..... 3
- (iv) Completion of division..... 2

**(c) Rectangle**

- (i) Redrawing of circle, chord CD and the point A..... 3
- (ii) Positioning of 1<sup>st</sup> vertex at A ..... 2
- (iii) Locating 2<sup>nd</sup> vertex on circle/line ..... 1
- (iv) Locating 3<sup>rd</sup> vertex and drawing locus...(2,3)..... 5
- (v) Locating other vertices of required rectangle and drawing same ..... 4

**Total****50**

**QUESTION 3**

**MARKS**

**(a) Cylinder A, Cone B and Sphere C**

- (i) Elevation of cylinder A and cone B ..... 3
- (ii) Plan of cylinder A and cone B..... 3
- (iii) Locate elevation of point P and draw perpendicular..... 2
- (iv) Bisection of angle between cone edge and XY line ..... 2
- (v) Locate centre and draw elevation of sphere C ..... 2
- (vi) Project centre point to plan..... 1
- (vii) Locate centre in plan and draw plan of sphere (incl. hidden detail) ... 4

**(b) Projections of 2<sup>nd</sup> Cylinder**

- (i) Elevation of point Q ..... 1
- (ii) Locate plan of point Q and draw line OQ extended..... 2
- (iii) Drawing one set of relevant arcs/lines ..... 3
- (iv) Drawing second set of arcs/lines corresponding with (iii)..... 3
- (v) Drawing of correct locus .....1
- (vi) Draw plan of correct cylinder (incl. hidden detail) ..... 2
- (vii) Draw elevation of correct cylinder (incl. hidden detail) ..... 3
- (viii) Determine plan and elevation of line of contact between cylinders ... 3

**(c) Tangent Plane**

- (i) Elevation and plan of circumscribing cone about sphere C..... 5
- (ii) Elevation and plan of 60° cone at point R..... 4
- (iii) Horizontal trace tangential to both circles..... 3
- (iv) Construct and draw correct vertical trace..... 3

**Total** **50**

**QUESTION 4**

**MARKS**

**Outline Plan and Elevation**

- (i) Drawing outline plan of pentagonal prism ..... 6
- (ii) Determination of heights and drawing of outline elevation..... 4
- (iii) Drawing of cut surfaces in plan..... 5
- (iv) Drawing outline elevation of inclined prism...(3,1) ..... 4
- (v) Transfer of widths to plan..... 3

**Interpenetration**

- (vi) Determining points **A, B, C, D & E** in elevation and plan ..... 5
- (vii) Determining points **F & G** in elevation and plan...(1,1)..... 2
- (viii) Determining points **H, I, J, & K** in elevation and plan...(4x1)..... 4
- (ix) Determining points **L, M, N & O** in plan ..... 4
- (x) Determining points **P & Q** in plan ..... 2
- (xi) Determining points **R & S** in plan..... 4
- (xii) Joining intersection points in correct order ..... 4
- (xiii) Completion of drawing (incl. hidden detail) ..... 3

**Total** **50**

**QUESTION 5**

**MARKS**

- (a)
- (i) Drawing figure as given ..... 4
  - (ii) Dividing sector into a number of equal parts (8 min) ..... 2
  - (iii) Dividing arc PA into a number of equal parts..... 3
  - (iv) Stepping distances to locate B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> etc ..... 2
  - (v) Location of O<sub>1</sub>, O<sub>2</sub>, O<sub>3</sub> etc ..... 3
  - (vi) Drawing arcs OP<sub>1</sub>, OP<sub>2</sub>, OP<sub>3</sub> from O<sub>1</sub>, O<sub>2</sub> and O<sub>3</sub>, respectively ..... 4
  - (vii) Drawing arcs C<sub>1</sub>-P<sub>1</sub>, C<sub>2</sub>-P<sub>2</sub>, C<sub>3</sub>-P<sub>3</sub> from B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, respectively ..... 8
  - (viii) Plotting of correct curve ..... 8
- (b) **Logarithmic Spiral**
- (i) Setting up 30° intervals ..... 3
  - (ii) Setting up triangle with sides in the ratio of 5:4 ..... 3
  - (iii) Determining successive radii for spiral ..... 7
  - (iv) Completion of spiral (Any = 1) ..... 3

**Total**

**50**

**QUESTION 6**

**MARKS**

- (a) (i) Drawing straight line AFB ..... 3  
 (ii) Drawing arc radius 125mm with centre A ..... 3  
 (iii) Drawing arc radius 95mm with centre B to locate 2<sup>nd</sup> focal point..... 3  
 (iv) Drawing axis and locating points on the curve (min 4 + vertex)..... 6  
 (v) Drawing curve...(Any = 2) ..... 4

**20mm Circle**

- (vi) Drawing of normal at point B..... 4  
 (vii) Drawing of circle radius 20mm..... 2

- (b) (i) Drawing lines PF and PC ..... 3  
 (ii) Determining axis of curve ..... 4  
 (iii) Locating point on directrix and drawing directrix ..... 4  
 (iv) Locating points on the curve...(min 5 + vertex)..... 6  
 (v) Drawing curve...(Any = 1)..... 2

**Tangent**

- (vi) Drawing line FX from focus at 90° to PF..... 1  
 (vii) Determining point of contact..... 3  
 (viii) Drawing of required tangent...(Any = 1)..... 2

*or*

- (vi) Drawing chords parallel to PF, bisecting them, joining midpoints  
 & extending line to establish point of contact..... 4  
 (vii) Drawing of required tangent...(Any = 1)..... 2

**Total** **50**



**QUESTION 7****MARKS****(a) Outline Plan and Elevation**

- (i) Drawing plan of pyramid resting on H.P. .... 4
- (ii) Drawing elevation of pyramid resting on H.P..... 2
- (iii) Rotated pyramid in elevation..... 4
- (iv) Required plan of pyramid..... 5
- (v) Drawing of VTH ..... 2

**(b) Cut surface**

- (i) Cut surface in elevation ..... 5
- (ii) Completion of plan and elevation ..... 6

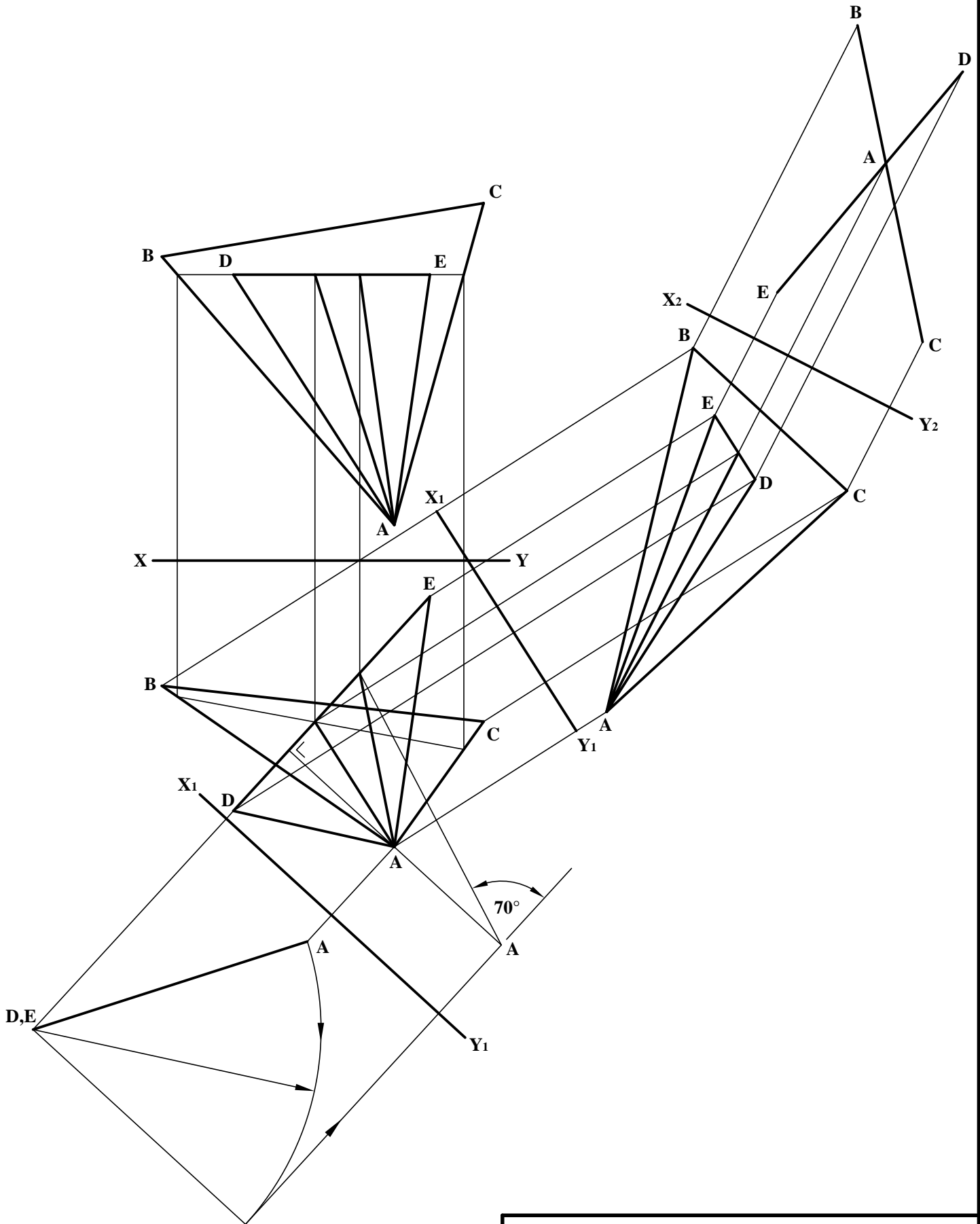
**(c) Pyramid**

- (i) Drawing of  $V_1T_1H_1$ ..... 3
- (ii) Auxiliary direction and  $X_1Y_1$  ..... 2
- (iii) Edge view of plane ..... 3
- (iv) Pyramid in auxiliary view ..... 3
- (v) Required plan of pyramid..... 5
- (vi) Drawing elevation of pyramid..... 6

*or*

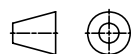
- (i) Drawing of  $V_1T_1H_1$ ..... 3
- (ii) Rabatment direction..... 2
- (iii) Rabatted V.T..... 3
- (iv) Pyramid face in rabatted position..... 2
- (v) Required plan of pyramid (2 further points) ..... 6
- (vi) Drawing elevation of pyramid..... 6

**Total****50**



TECHNICAL DRAWING - HIGHER LEVEL - PAPER 1.

PROJECTION

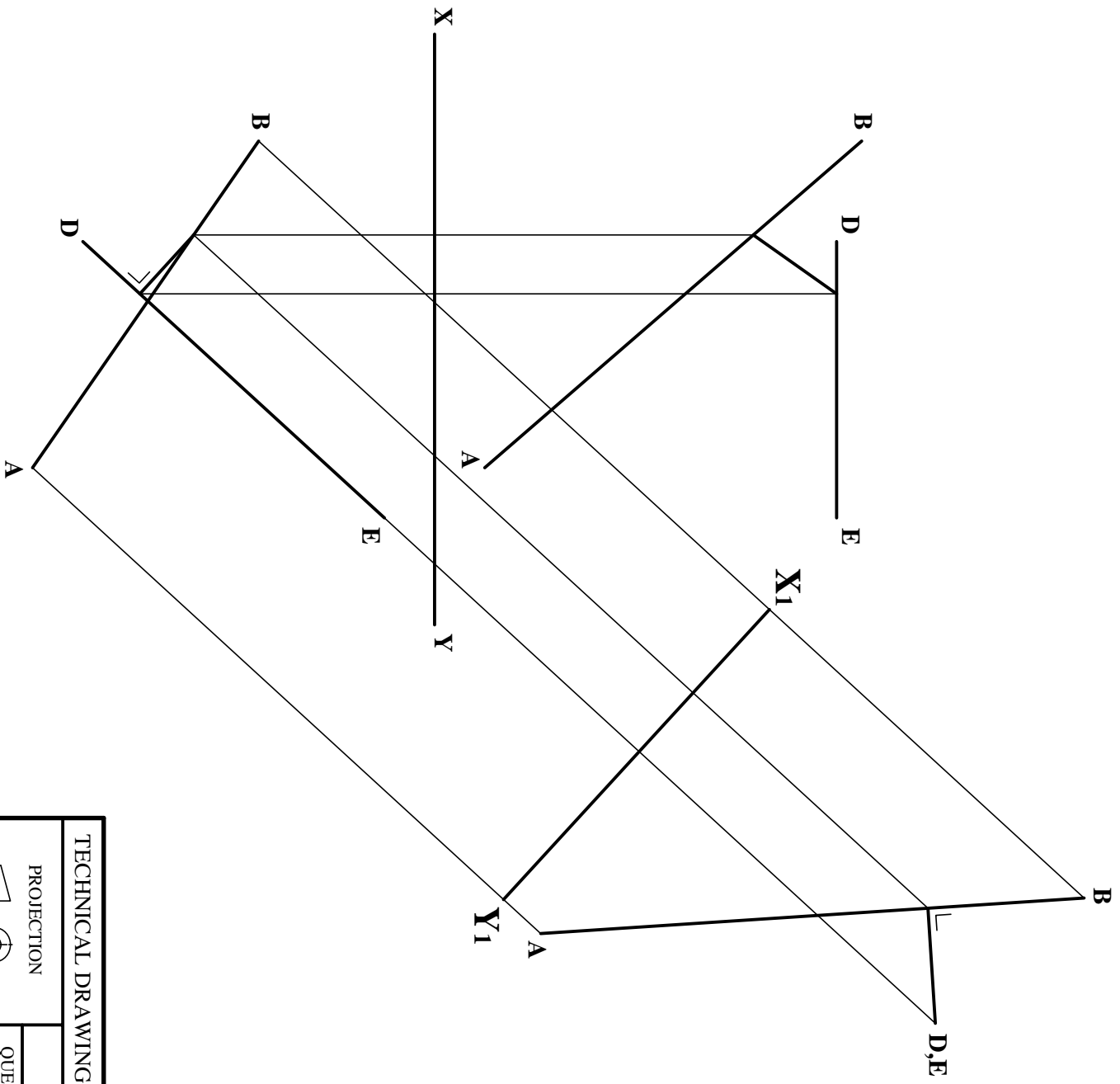


MARKING SCHEME.

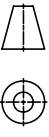
QUESTION 1(a), (b) & (c).

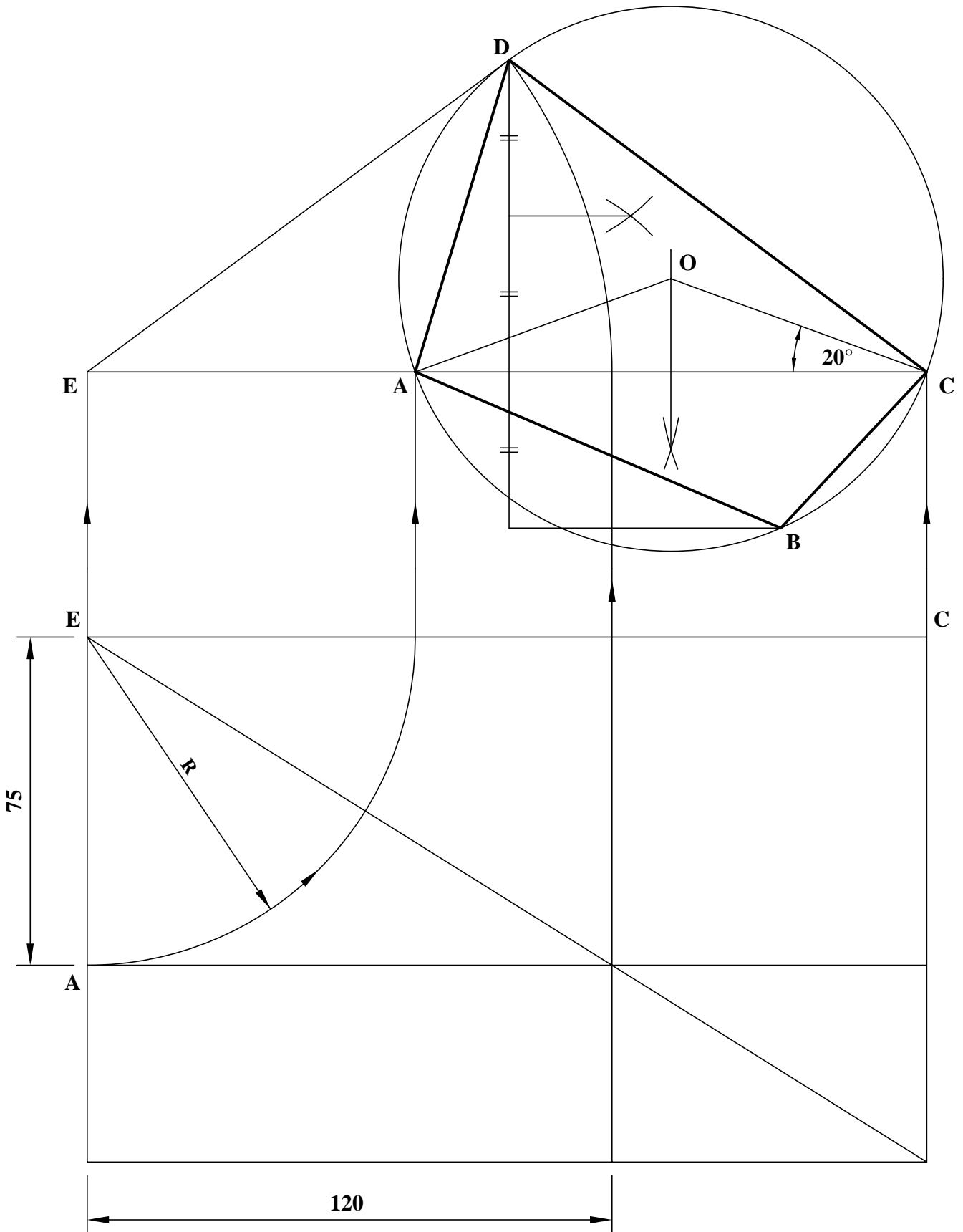
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DATE: JUNE 2006.



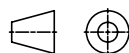
TECHNICAL DRAWING - HIGHER LEVEL - PAPER 1.	
PROJECTION	MARKING SCHEME.
QUESTION I(d)	
SCALE: N/A.	DATE: JUNE 2006.





TECHNICAL DRAWING - HIGHER LEVEL - PAPER 1.

PROJECTION

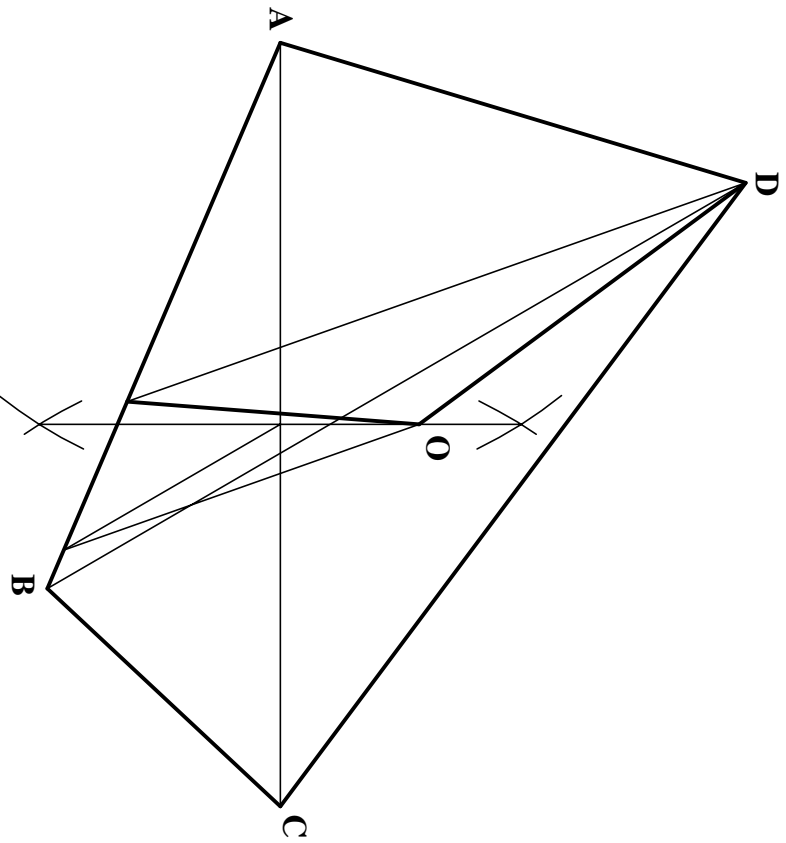
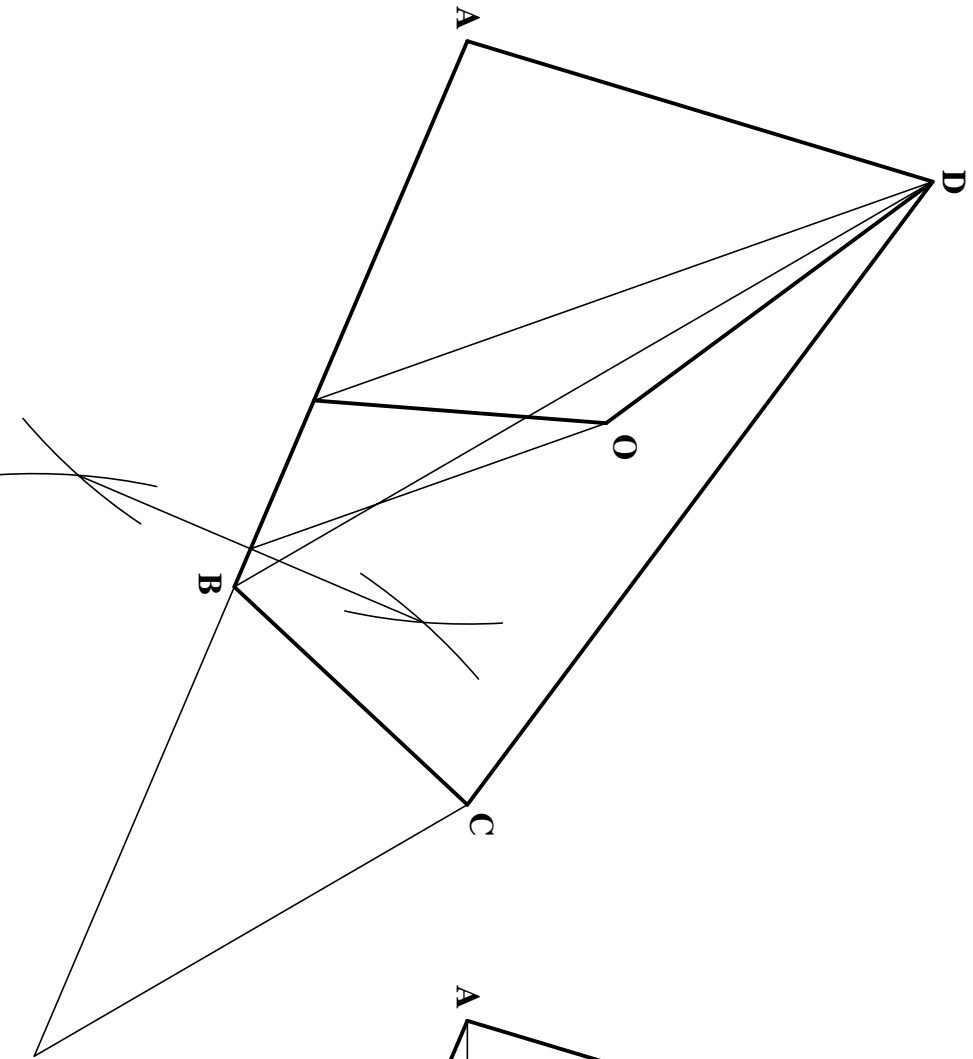


MARKING SCHEME.

QUESTION 2(a).

SCALE: N/A.

DATE: JUNE 2006.



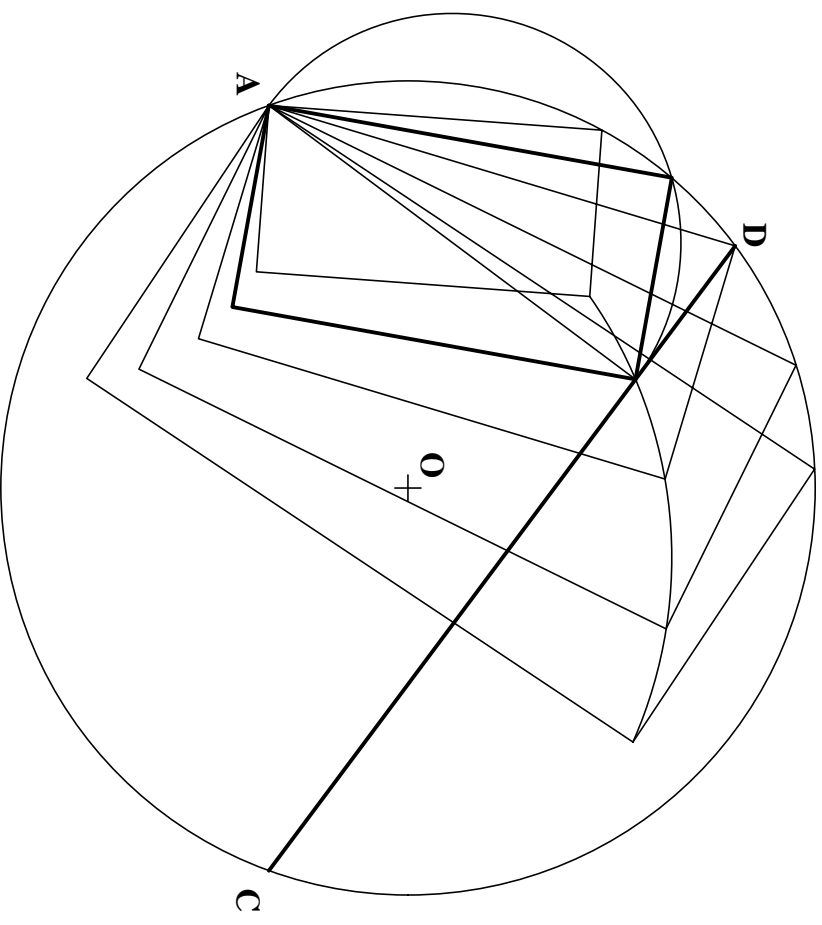
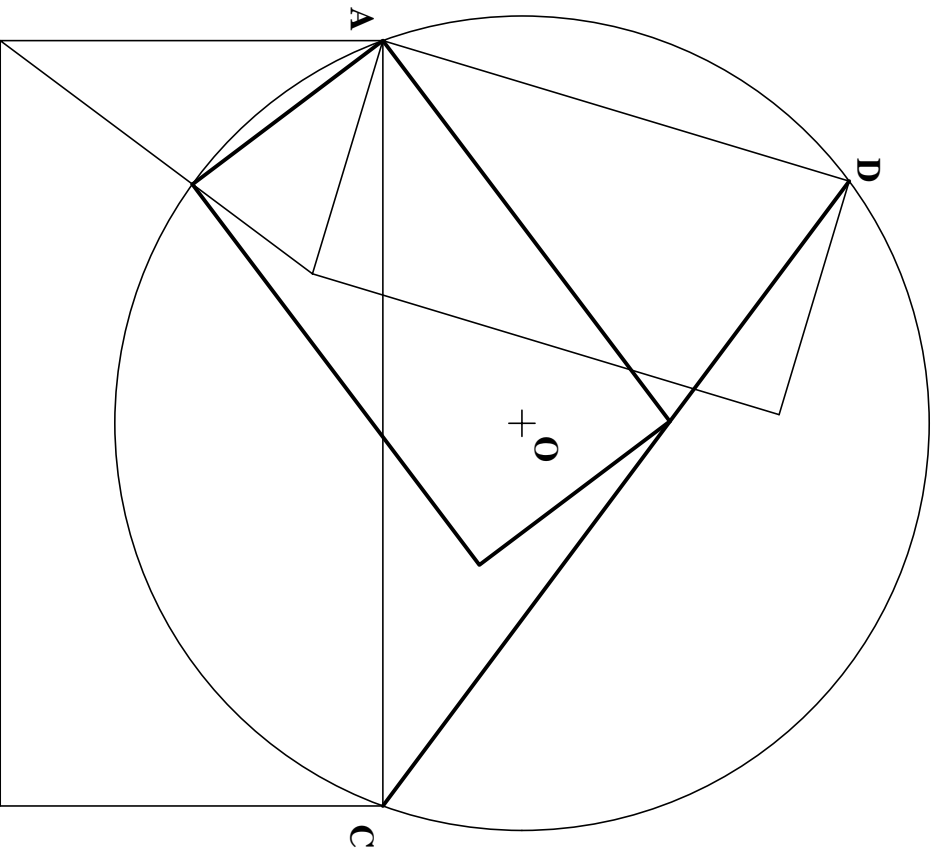
TECHNICAL DRAWING - HIGHER LEVEL - PAPER 1.

MARKING SCHEME.

QUESTION 2(b).

SCALE: N/A.

DATE: JUNE 2006.



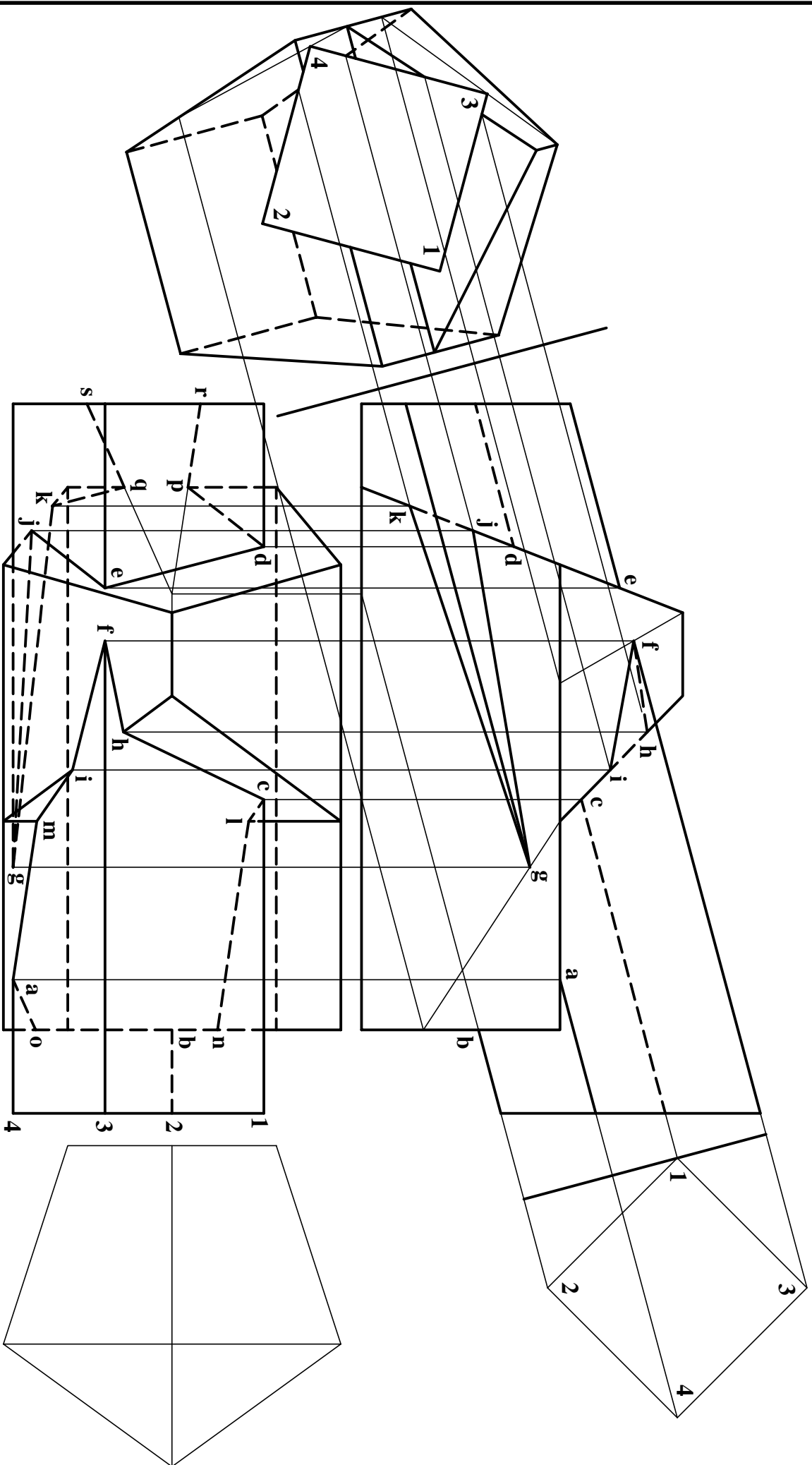
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MARKING SCHEME.

QUESTION 2(c).

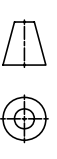
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TECHNICAL DRAWING - HIGHER LEVEL - PAPER 1.

PROJECTION



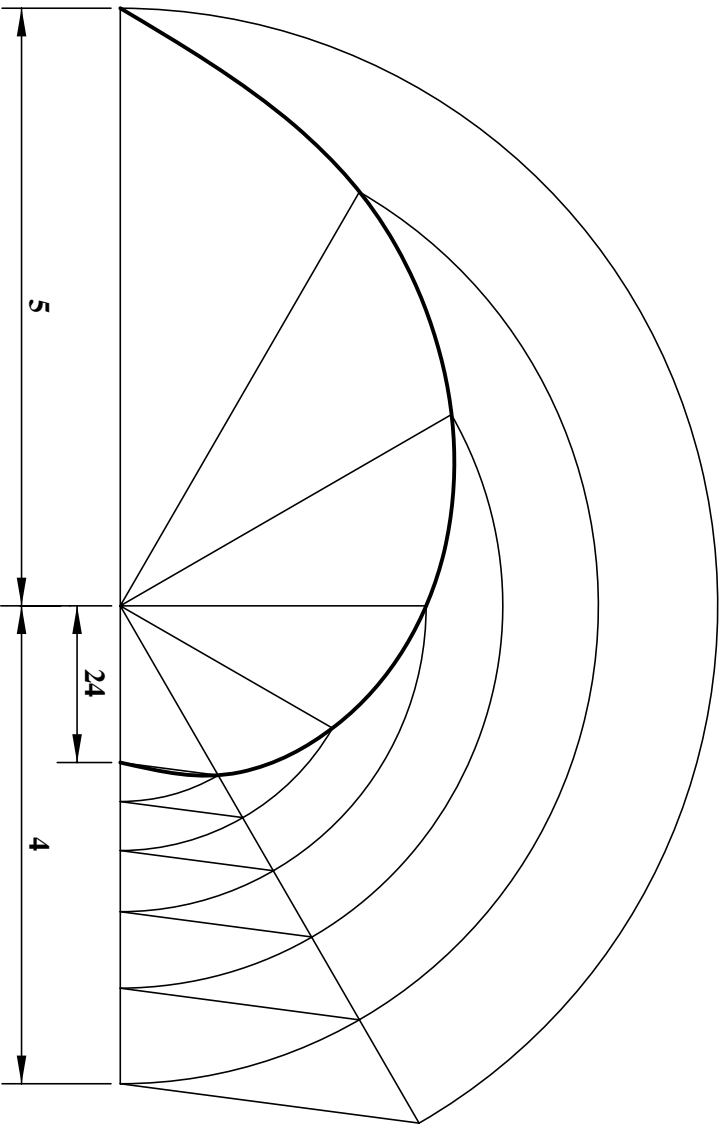
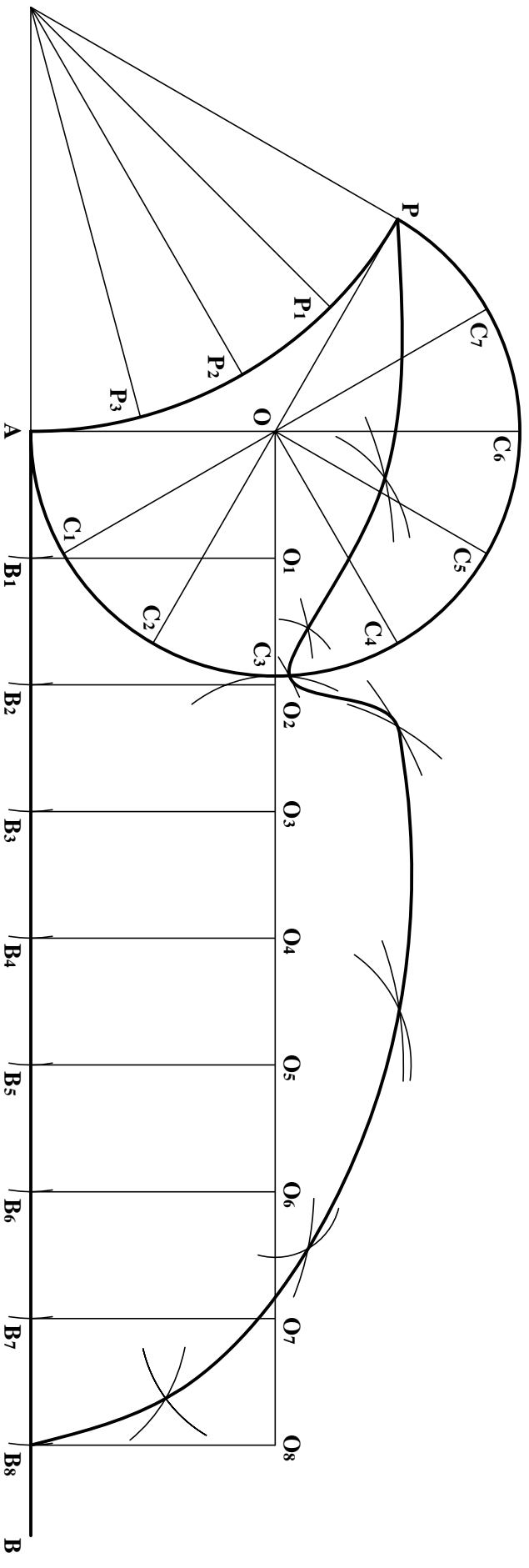
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QUESTION 4.

SCALE: N/A.

DATE: JUNE 2006.





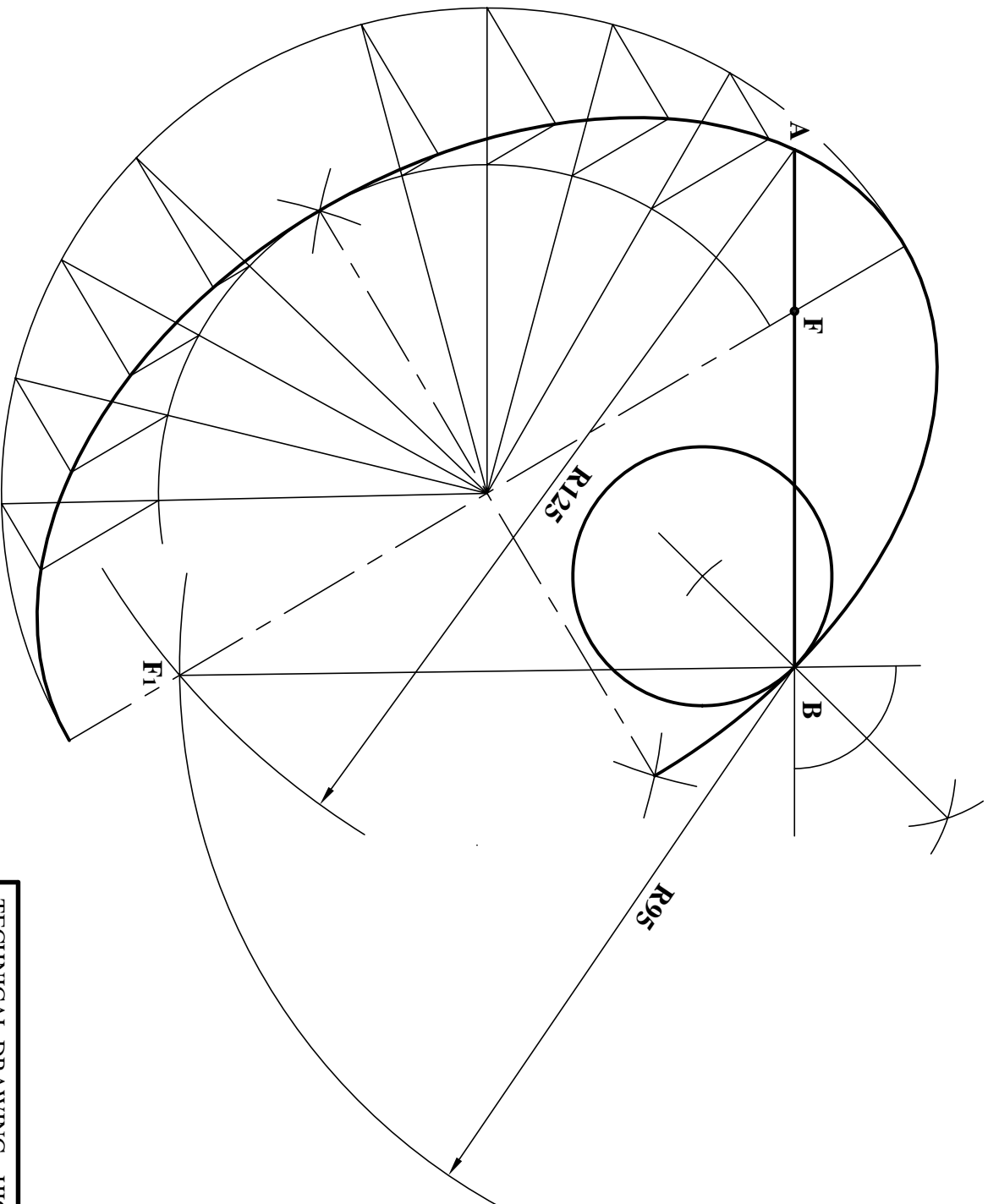
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QUESTION 5.

SCALE: N/A

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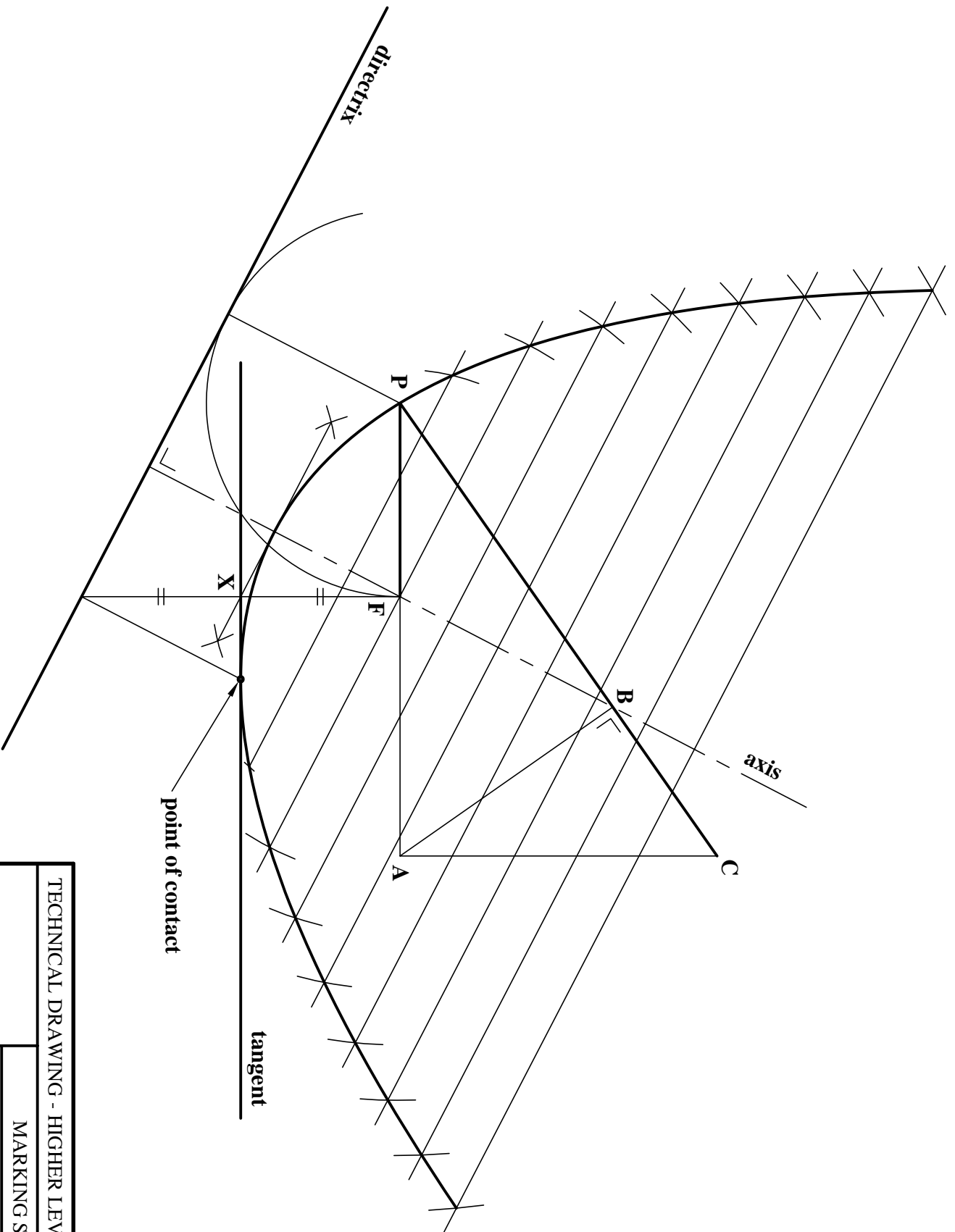
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MARKING SCHEME.

QUESTION 6(a).

SCALE: 1:1.

DATE: JUNE 2006.



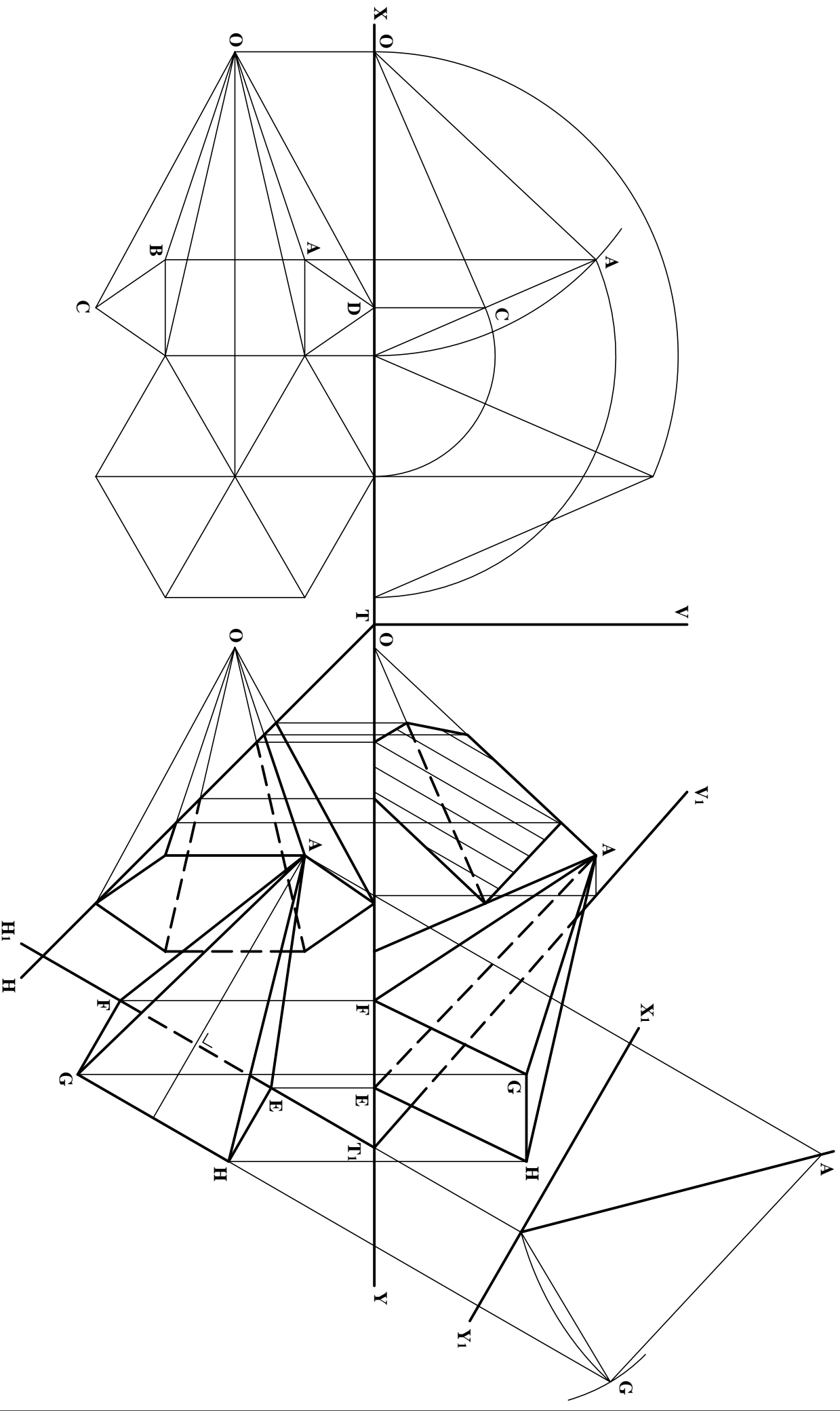
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MARKING SCHEME.

QUESTION 6(b).

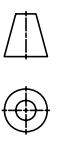
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DATE: JUNE 2006.



TECHNICAL DRAWING - HIGHER LEVEL - PAPER 1.

PROJECTION



MARKING SCHEME.

QUESTION 7.

SCALE: N/A.

DATE: JUNE 2006.