AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA | DEPARTMENT OF EDUCATION AND SCIENCE

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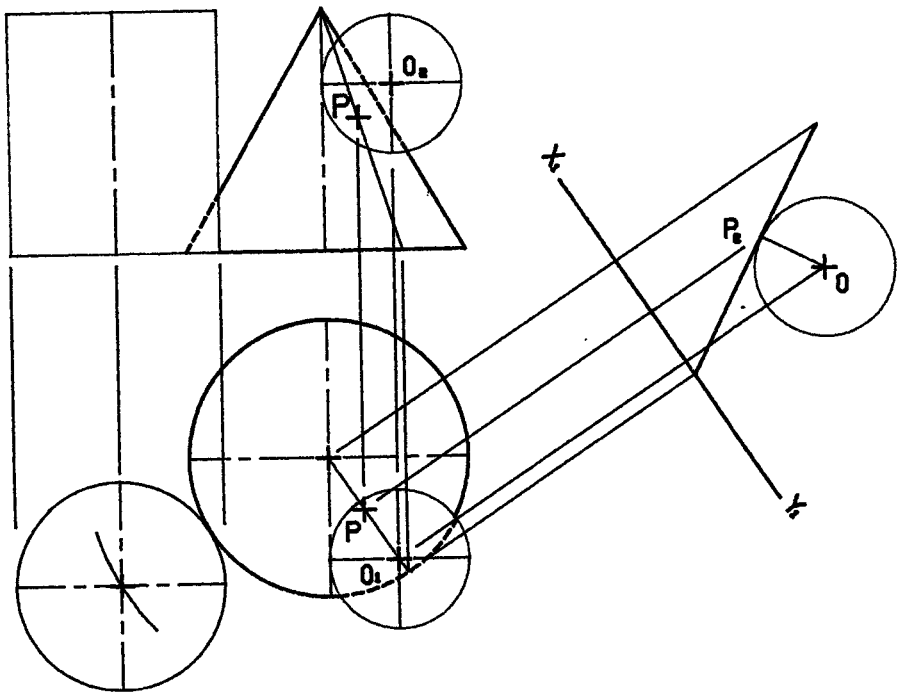
Marking Scheme — *Leaving Certificate Examination, 2001*

Technical Drawing — *Ordinary Level*

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION 2001



TECHNICAL DRAWING

PAPER 1 ORDINARY LEVEL

MARKING SCHEME

Question 1

Part (a) Elevation	**18**	
1. Outline Elevation		8
2. Line of intersection between A and B		4
3. Complete elevation (3x2)		6
Part (b) Plan	**10**	
4. Outline plan (6x1)		6
5. Complete plan (2x2)		4
Part (c) New Elevation	**17**	
6. X_1 Y_1 Parallel to A in plan		2
7. Projections from plan		2
8. Heights from elevation (2x1)		2
9. Surface A		4
10. Complete new elevation (7x1)		7
11. **Draughtsmanship**	**5**	5
	Total	**50**

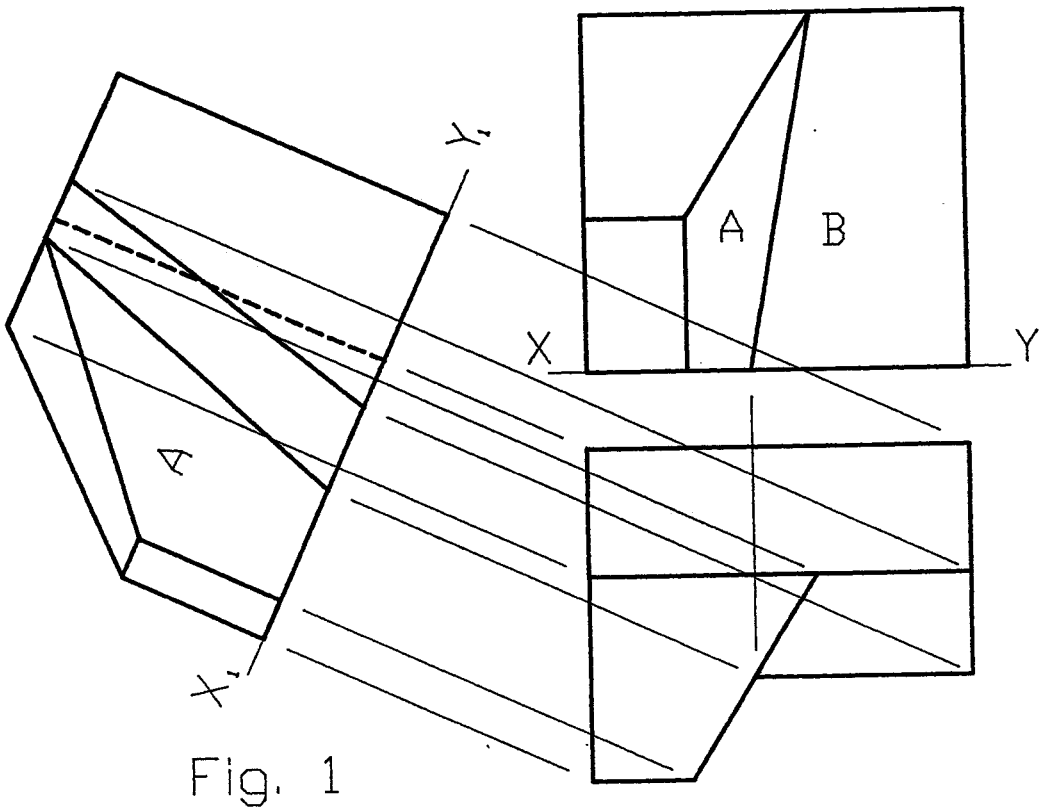


Fig. 1

Leaving Certificate 2001 Marking Scheme

Technical Drawing Paper 1 Ordinary Level

Question 2

Part (a) Triangle ABC	**18**	
1. Draw line AC 124 long		6
2. Divide line AC into 6 parts		6
3. Locate point B		2
4. Draw triangle ABC		4
Point D	**12**	
5. Divide line AC into 5 parts		6
6. Locate point D		2
7. Draw triangle ACD		4
Part (b) Area Conversion	**15**	
8. ABCD to rectangle		8
9. Rectangle to a square		5
10. Draw square		2
11. **Draughtsmanship**	**5**	5
	Total	**50**

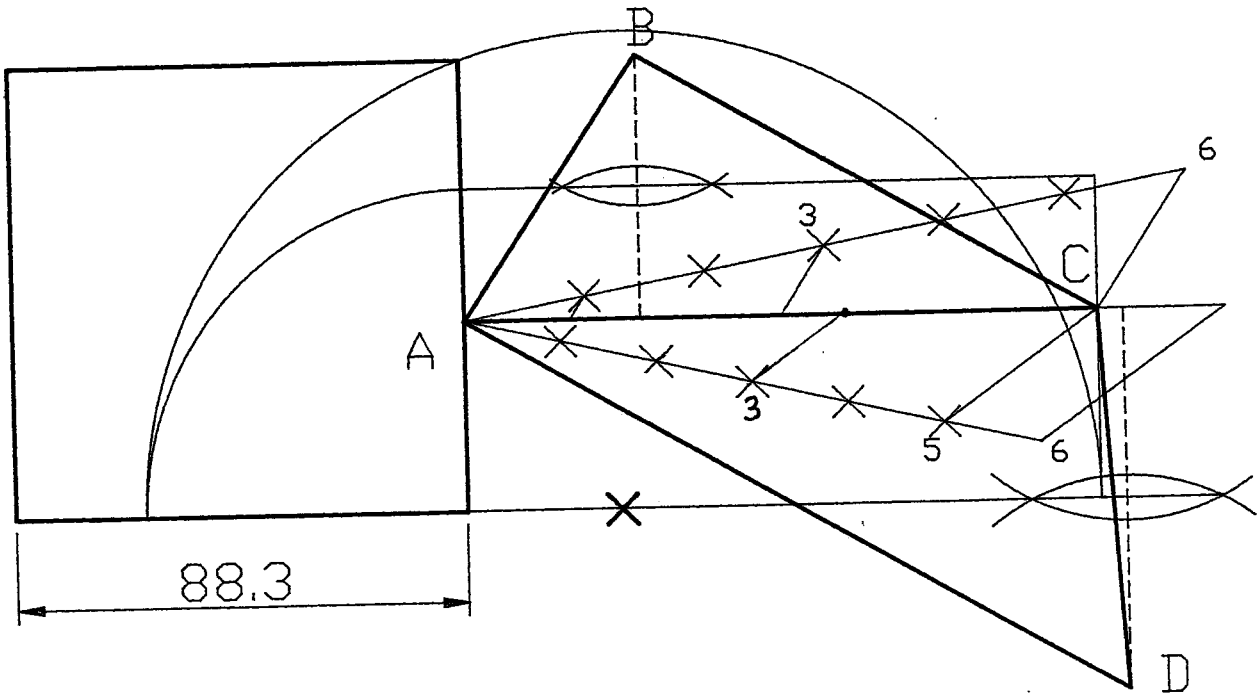


Fig. 2

Question 3

Part (a)	**24**	
1. Given plan		6
2. Given elevation		6
3. Locating point P in elevation		6
4. Cylinder in plan		6
Part (b)	**21**	
5. Locating point P_2		4
6. Locating point O		4
7. Locating point O_1		4
8. Locating point O_2		3
9. Draw spheres (2,2)		4
10. Hidden detail		2
11. **Draughtsmanship**	**5**	5
	Total	50

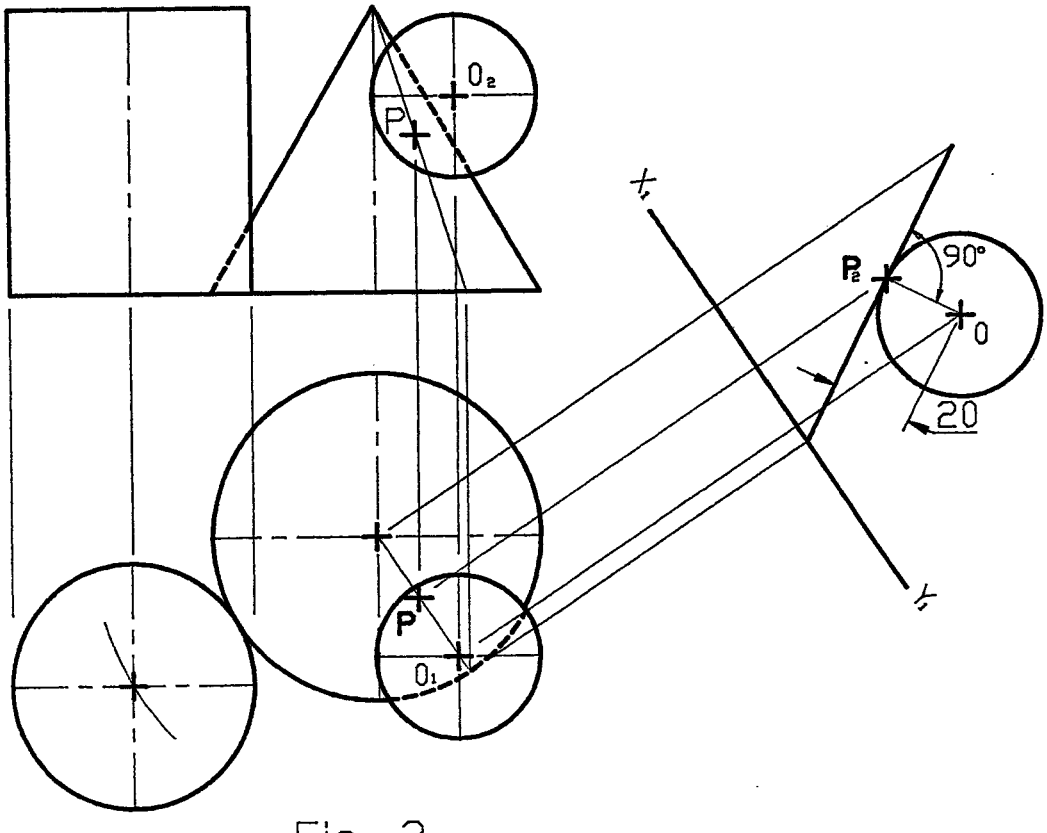


Fig. 3

Question 4

Part (a)	**29**	
1. Circle, line AB and point P		9
2. Division of circle		4
3. Centres marked on line OE		4
4. Project from divisions on circle		4
5. Locate points on locus		4
6. Draw curve		4
Part (b)	**16**	
7. Points P,R,S along line PS		4
8. Division of line RS		3
9. Angular divisions		3
10. Mark points on curve		3
11. Draw curve		3
12. **Draughtsmanship**	**5**	5
	Total	50

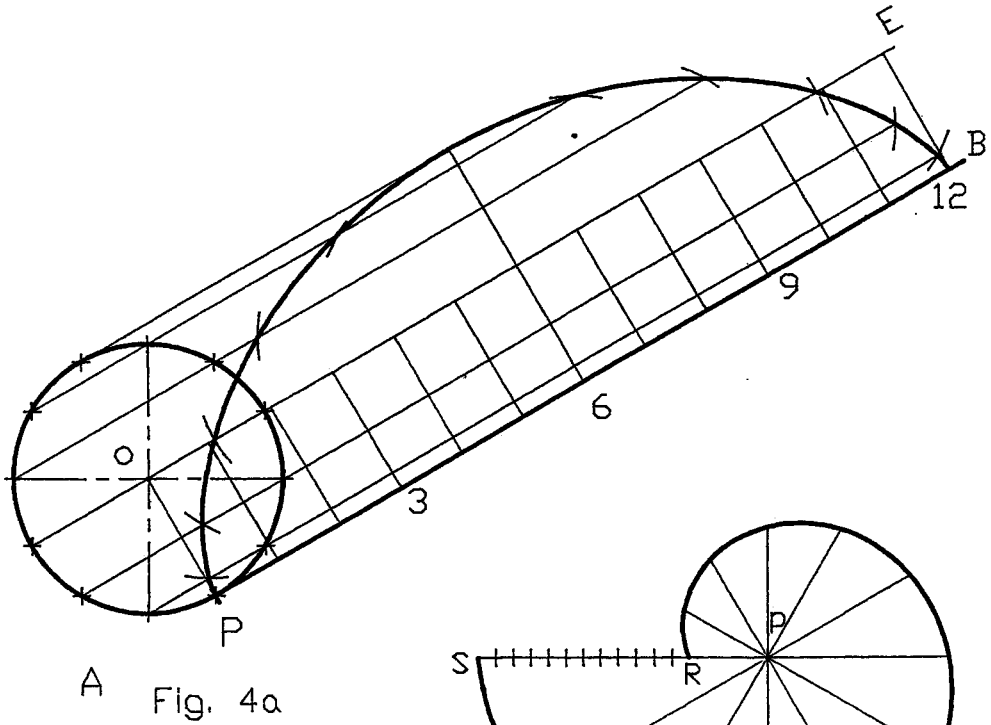


Fig. 4a

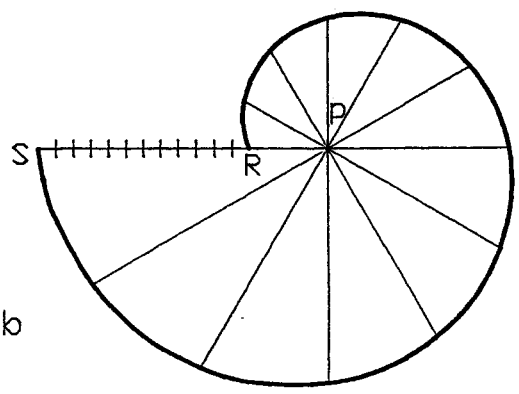


Fig. 4b

Question 5

Part (a) Setting Up	**15**	
1. Given Plan		5
2. Given elevation		6
3. Traces VTH		4
Auxiliary Elevation	**9**	
4. X_1Y_1 perp. H.T.		2
5. Projections parallel to H.T.		2
6. Edge view of plane		2
7. Auxiliary view of solid		3
Truncation	**14**	
8. Points abcd in plan		4
9. Points abcdef in elevation		6
10. Complete plan		2
11. Complete elevation		2
Part (b) True Shape	**7**	
12. Setting up true widths and lengths (2,2)		4
13. Draw true shape		3
14. **Draughtsmanship**	**5**	5
	Total	**50**

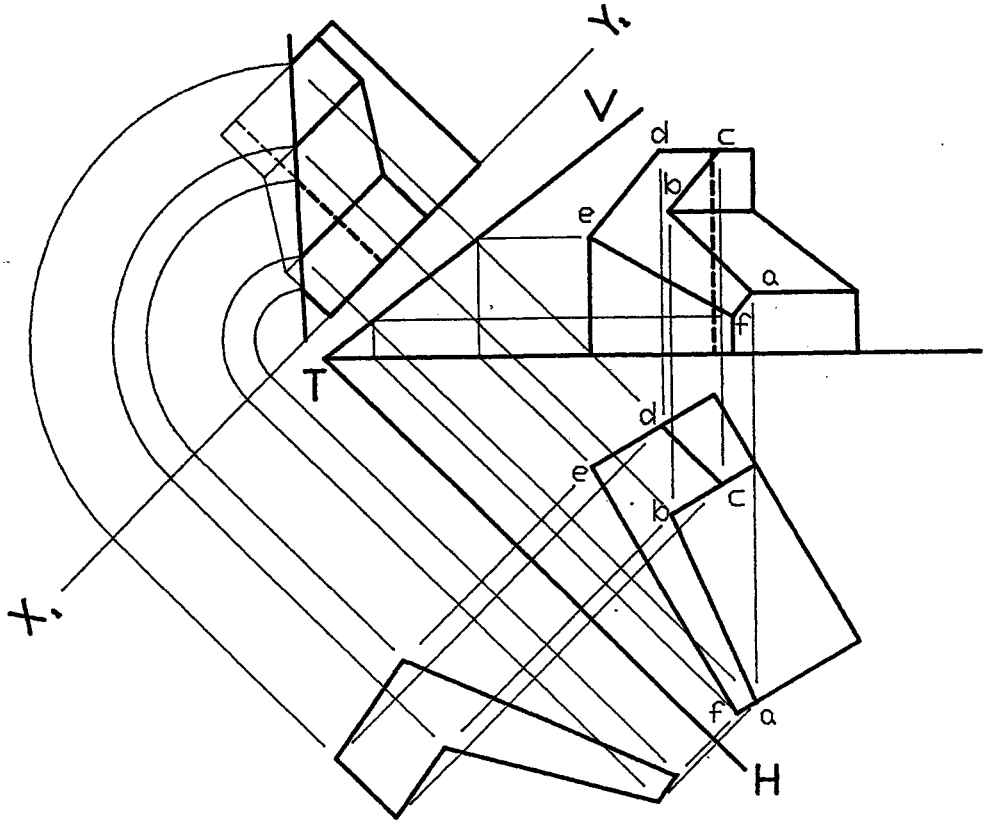


Fig. 5

Question 6

Part (a) Ellipse	**18**	
1. Setting up major and minor axes		6
2. Points on curve		8
3. Draw curve		4
Tangent	**13**	
4. Locating point S		1
5. Locate foci points		4
6. Tangent construction		4
7. Draw tangent		4
Part (b)	**14**	
8. Setting up as given (1,1,1)		3
9. Locating directrix		4
10. Locating vertex		2
11. Points on curve		3
12. Draw curve		2
13. **Draughtsmanship**	**5**	5
	Total	**50**

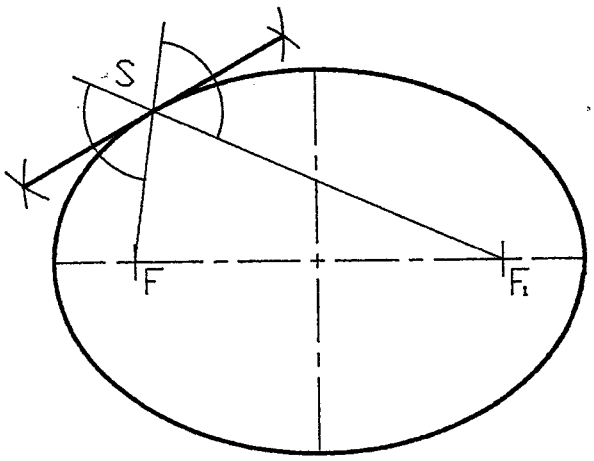
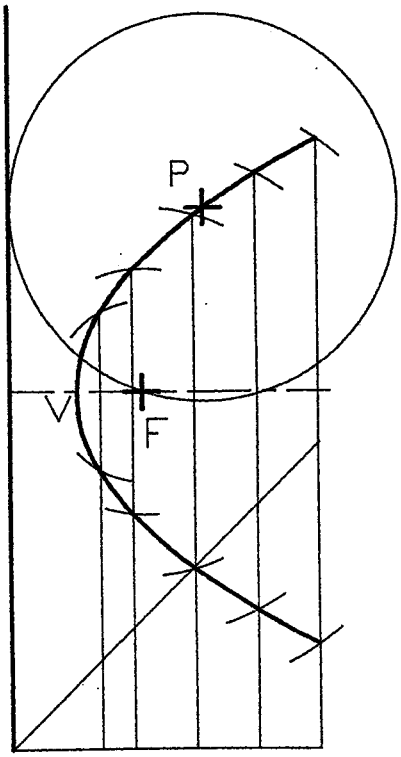


Fig. 6a



Question 7

	11	
1. Draw both solids in plan		6
2. Draw both solids in elevation		5
End View	**11**	
3. Draw prism		6
4. Draw main solid		5
Interpenetration (plan)	**13**	
5. Complete left hand side		3
6. Points on right hand side (5x1)		5
7. Complete right hand side (5x1)		5
Interpenetration (Elevation)	**10**	
8. Complete right hand side		2
9. Points on left hand side (3x2)		6
10. Complete left hand side (2x1)		2
11. **Draughtsmanship**	**5**	5
	Total	50

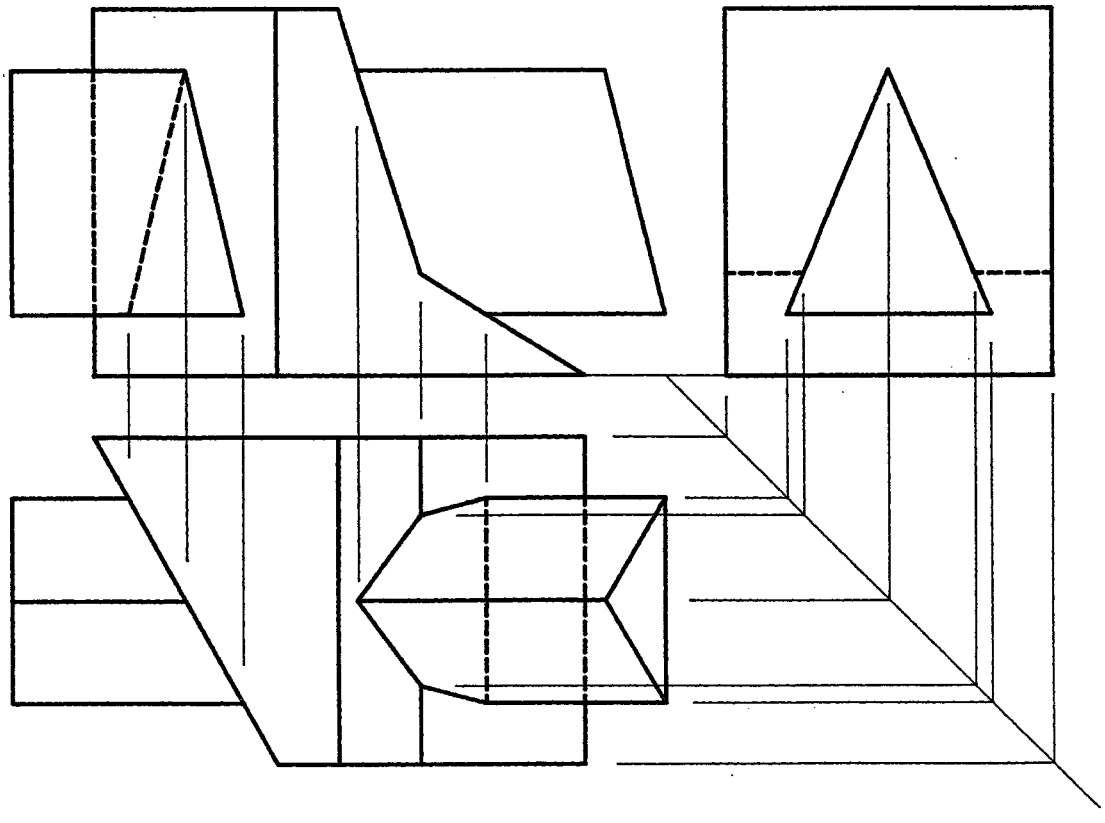


Fig. 7

TECHNICAL DRAWING

LEAVING CERTIFICATE EXAMINATIONS 2001

PAPER II A

"ENGINEERING APPLICATIONS"

ORDINARY LEVEL

MARKING SCHEME

QUESTION 1		100 MARKS
QUESTION 2		50 MARKS
QUESTION 3		50 MARKS
QUESTION 4		50 MARKS
QUESTION 5	SECTION A	50 MARKS
	SECTION B	50 MARKS

ANSWER QUESTION 1 AND **ANY** TWO OTHERS

MAXIMUM MARKS AWARDED 200

QUESTION 1 **100 MARKS**

CONCEPTS

(a)	**Assembly**	4 marks
(b)	**Elevation**	30 marks
(c)	**Sectional Elevation**	41 marks
(d)	**Additional Requirements**	25 marks

1A ASSEMBLY **4 marks**

(i)	Pin to pulley	1
(ii)	Pin and pulley to bracket	1
(iii)	Washer to pin	1
(iv)	Hex. nut to pin	1

1B ELEVATION **30 marks**

1. Bracket 14 marks

(i)	Right angle vertical	2
(ii)	Right angle horizontal	2
(iii)	Boss	2
(iv)	Rib	2
(v)	Left triangular face	2
(vi)	Right face	2
(vii)	Circular face	2

2. Washer 2 marks

(i)	Circle	2

3. Hex. nut 6 marks

(i)	Six faces	3
(ii)	Top curves (circle)	3

4. Pin 4 marks

(i)	Outer circle (diam.)	2
(ii)	Screw Thread	2

5. Pulley 2 marks

6. Centre lines (x2) 2 marks

1C SECTIONAL ELEVATION **41 marks**

1. Bracket 7 marks

(i)	Bottom Rectangle	1
(ii)	Holes x 3	1
(iii)	Right angle horizontal section	1
(iv)	Right angle vertical section	1
(v)	Triangular web	1
(vi)	Lower section of "eye"	1
(vii)	Top section of "eye"	1

2. Washer — 2 marks

(i) Rectangle 2

3. Hex nut — 6 marks

(i) Faces (in projection) 2
(ii) Depth 2
(iii) Top Curves 2

4. Pin — 16 marks

(i) Top Curves 2
(ii) Flats 2
(iii) Shoulder 2
(iv) Pulley Length 2
(v) "Eye" Length 2
(vi) Thread before washer 2
(vii) Thread after nut 2
(viii) Dome 2

5. Pulley — 8 marks

(i) Boss x 2 2
(ii) Flats diameter x 2 2
(iii) Vee section 2
(iv) Clearance 2

6. Centre Lines — 2 marks

1D ADDITIONAL REQUIREMENTS — **25 marks**

(i) First or third angle projection — 4 marks
(ii) ISO Symbol — 4 marks
(correct 4 marks)
(incorrect 2 marks)

(iii) Title Block — 3 marks
(a) Form 1
(b) Width 1
(c) Spacing 1

(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**	10 marks
B.	**Surface development of pipe B**	22 marks
C.	**Joint**	8 marks
D.	**Presentation**	10 marks

2A GIVEN VIEW 10 marks

(i)	Top pipe outline	2
(ii)	Transition pipe outline	2
(iii)	Bottom pipe outline	2
(iv)	Lines of intersection	2
(v)	Centre line	2

2B DEVELOPMENT OF PIPE B 22 marks

(i)	Drawing of semi-circle	2
(ii)	Division of semi-circle	2
(iii)	Drawing of generators	2
(iv)	Projection of diam. to development	2
(v)	Marking out diam.	2
(vi)	Projection of lengths of generators	2
(vii)	Plotting of top curve	2
(viii)	Drawing of Top Curve	2
(ix)	Plotting of bottom curve	2
(x)	Drawing of bottom curve	2
(xi)	Seam on xx	2

2C JOINT 8 marks

(i)	External grooved seam	2
(ii)	Left hand lap	2
(iii)	Right hand lap	2
(iv)	Sketch	2

2D PRESENTATION 10 marks

Excellent	10
Very good	8
Good	6
Fair	4
Poor	2

Note: Indexing to be taken account of under this heading.

QUESTION 3 **50 marks**

3A. Cam Profile 30 Marks
3B. Linkage 20 Marks

3A CAM PROFILE **30 Marks**

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

(a) Cam Profile 15 marks

(i)	Minimum radius	2
(ii)	Camshaft diameter	1
(iii)	Maximum radius	2
(iv)	0^0 to 180^0 simple harmonic motion	2
(v)	180^0 to 270^0 dwell	2
(vi)	270^0 to 360^0 uniform velocity	2
(vii)	Direction of rotation	2
(viii)	Drawing of profile	2

(b) Displacement Diagram 10 marks

(i)	Lift or travel	2
(ii)	0^0 - 360^0 divisions	1
(iii)	0^0 - 180^0 simple harmonic motion	2
(iv)	180^0 - 270^0 dwell	2
(v)	270^0 - 360^0 uniform velocity	2
(vi)	Drawing of curve	1

(c) Presentation 5 marks

Excellent	5
Very Good	4
Good	3
Fair	2
Poor	1

Note: Indexing to be taken into account under this heading.

3B. LINKAGE **20 Marks**

(a) Line Diagram 3 marks
(b) Locus of D 11 marks
(c) Machine guard 3 marks
(d) Presentation 3 marks

(a) Line Diagram 3 marks

(i)	Crank OA	1
(ii)	Rod CD	1
(iii)	Link BC	1

(b) Locus of D 11 marks

(i)	Locus of A	1
(ii)	Division of A	2
(iii)	Locus of C	2

(iv)	Plotting of points on C	2
(v)	Plotting of points of D	2
(vi)	Drawing of locus of D	2

(c) Machine Guard Profile 3 marks

Excellent (clearance 15)	3
Good	2
Fair	1

(d) Presentation 3 marks

Excellent	3
Good	2
Fair	1

Note: Indexing to be taken into account under this heading

QUESTION 4 **50 MARKS**

(A)	**Dimensioned Drawing**	38 marks
(B)	**Mechanism**	6 marks
(C)	**Conventional Features**	6 marks

4A DIMENSIONED DRAWING — 38 marks

(a) Shape Description — 18 marks

(i)	Dome on thread	2
(ii)	Screw thread	2
(iii)	Under cut	2
(iv)	Taper	2
(v)	Keyway	2
(vi)	Diameter	2
(vii)	Screw thread	2
(viii)	Small diameter	2
(ix)	Square section	2

(b) Size Description — 17 marks

(i)	Diameters (x3)	3
(ii)	Lengths (x7)	4
(iii)	Keyway diameter	1
(iv)	Keyway depth	2
(v)	Screwthread metric	1
(vi)	Screwthread pitch	1
(vii)	Screwthread diameter	1
(viii)	Square Symbol	1
(ix)	Square Size	1
(x)	Undercut	2

(c) Presentation — 3 marks

(i)	Use of datum	1
(ii)	Centre lines	1
(iii)	Dimensions	1

4B. MECHANISM — 6 marks

Relief Valve		1
Part 1	Compression Spring	1
Part 2	Valve seat	1
Part 3	Body	1
Part 4	Pressure adjuster (screw)	1
Part 5	Locknut	1

4C. ENGINEERING TERMS — 6 marks

(i)	Bush	2
(ii)	Taper	2
(iii)	Lug	2

QUESTION 5 SECTION A **50 Marks**

5A Isometric View 38 Marks
5B Machine Parts 12 Marks

5A ISOMETRIC VIEW **38 Marks**

(a) Sectioned View Front 13 marks

(i)	Body left	2
(ii)	Body right	2
(iii)	Hole left	2
(iv)	Hole right	2
(v)	Inside hole	2
(vi)	Top of hole	2
(vii)	Centre lines	1

(b) Sectioned View Top 13 marks

(i)	Top left	2
(ii)	Top right	2
(iii)	Centre	2
(iv)	Web	2
(v)	Left hole	2
(vi)	Right hole	2
(vii)	Centre lines	1

(c) Unsectioned View 8 marks

(i)	Web side	1
(ii)	Web front	1
(iii)	Left front face	1
(iv)	Right front face	1
(v)	Left base top	1
(vi)	Right base top	1
(vii)	Side vertical	1
(viii)	Side angle	1

(d) Presentation 4 marks

(i)	Correct view	2
(ii)	Drawing	2
	Excellent 2	
	Good 1	

5B MACHINE PARTS **12 marks**

(a) End Cam 4 marks

(i)	Cam face	1
(ii)	Follower	1
(iii)	Drawing	1
(iv)	Indicated movement	1

(c) Thread Terms 4 marks

(i)	Pitch	1
(ii)	Thread Angle	1
(iii)	Root	1
(iv)	Drawing	1

(d) Thrust Bearing 4 marks

(i)	Bearing Surfaces	1
(ii)	Race	1
(iii)	Cage	1
(iv)	Drawing	1

QUESTION 5 **SECTION B** **50 Marks**

(a) Circle, mirror, break, trim, zoom, fillet, rotate etc. etc. 6 x 2 — 12 marks

(b) 0.5 — 4 marks

(c) — 12 marks

(i)	Keep away from magnets	4
(ii)	Store at correct temperature	4
(iii)	Do not interfere with the metal shutter	4

(d) — 10 marks

(i)	Faster rate of producing drawings
(ii)	Constant quality of drawings
(iii)	Greater accuracy of drawings
(iv)	Less repetition of drawings
(v)	Multicolour drawings
(vi)	Creation of database and library
(vii)	Less development required
(viii)	Quicker design calculations and Techniques

5 x 2

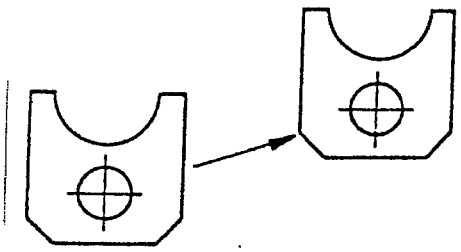
(e) **Commands** — **12 marks**

(i) **Translating**: is the capability to move parts of drawings and redrawing them in the new position to a selected scale. 4

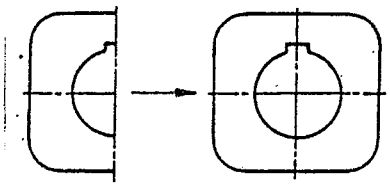
(ii) **Mirroring**: is the capability to create the reverse image of a feature about the chosen line of symmetry. 4

(iii) **Duplicating**: is the capability of redrawing a feature or component many times and displaying it in an orderly manner linearly or rotationally. 4

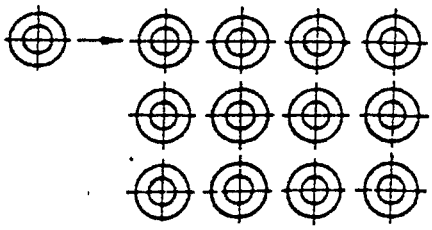
(i) **Translating**:



(ii) **Mirroring**:



(iii) **Duplicating**:



AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE 2001

TECHNICAL DRAWING

ORDINARY LEVEL

PAPER 11 B

MARKING SCHEME

QUESTION 1

Marks

(1) 3 ---- Draw the given plan

(2) 5 ---- Position Spectator, P.P., V.P.1 and V.P.2 in plan (1, 2, 2)

(3) 5 ---- Ground line, horizon line and V.P.'s in elevation (1, 2, 2)

(4) 2 ---- Projection lines from S to plan

(5) 6 ---- Perspective of base lines of block A

(6) 4 ---- Perspective of base lines of block B

(7) 3 ---- Heights 1 and 2 for block A

(8) 2 ---- Determine height for block B

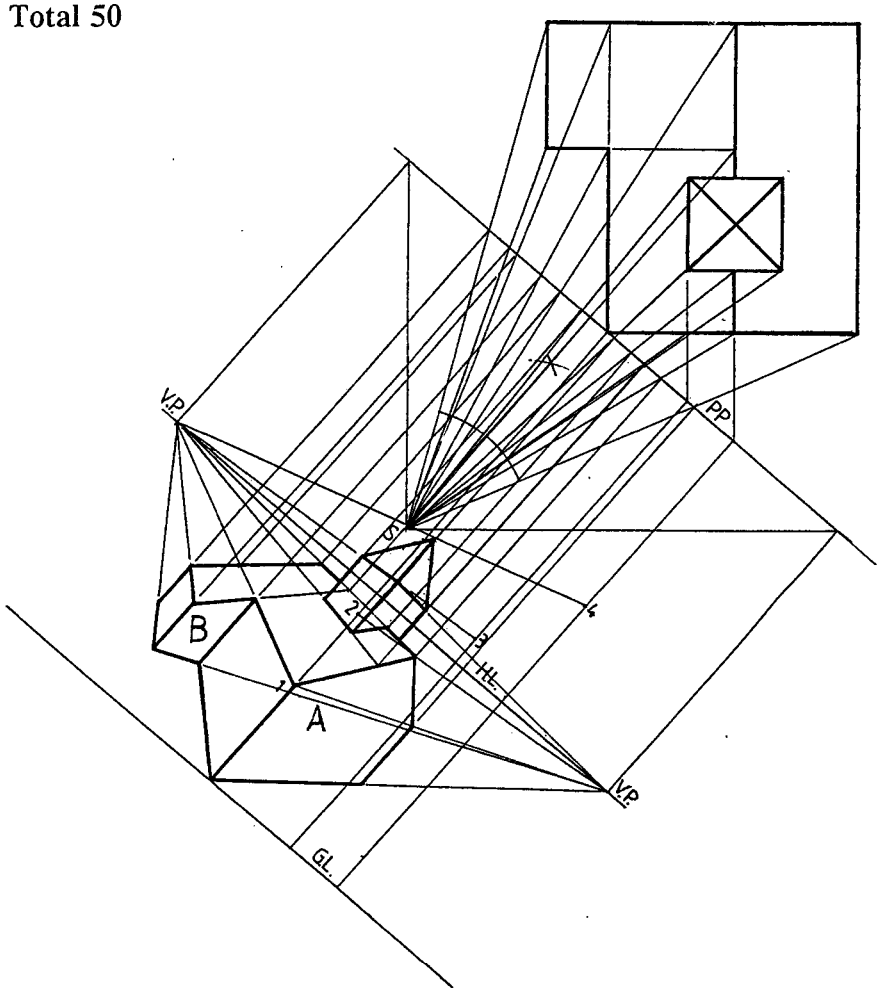
(9) 2 ---- Heights 3 and 4 for spire

(10) 7 ---- Completion of blocks A and B (4, 3)

(11) 6 ---- Completion of spire, lines of intersection on roof (4, 2)

(12) 5 ---- Presentation

Total 50



QUESTION 2

Marks

Plan and Elevation

(1) 2 ---- Draw roof peripeter in plan

(2) 4 ---- Draw edge views of surfaces B and D (2, 2)

(3) 2 ---- Measure height of surface B in elevation

(4) 4 ---- Complete elevation

(5) 4 ---- Determine lines of intersection between B and C and C and D in plan

(6) 4 ---- Complete the given plan

Pitch of Surface A

(7) 4 ---- Viewing direction, set up XY line, projection from plan, measure height

(8) 2 ---- Draw auxiliary elevation showing pitch

Development of surface D

(9) 3 ---- Determine true width

(10) 3 ---- Draw the development of surface D

Dihedral angle between surfaces C and D

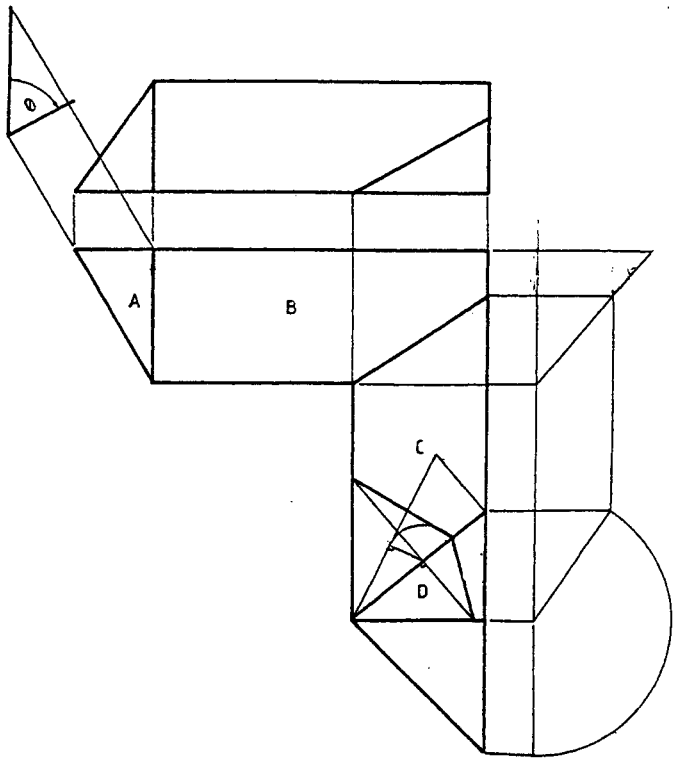
(11) 6 ---- True length of line of intersection between surfaces C and D

(12) 5 ---- Construction to find dihedral angle

(13) 2 ---- Dihedral angle between surfaces C and D

(14) 5 ---- Presentation

Total 50



QUESTION 3

Marks

(1) 6 ---- Draw the given plan and elevation

(2) 2 ---- Lines at appropriate angles in plan and elevation

(3) 18 ---- Determine points a, b, c, d, e, f, g, h, i on ground (9 x 2)

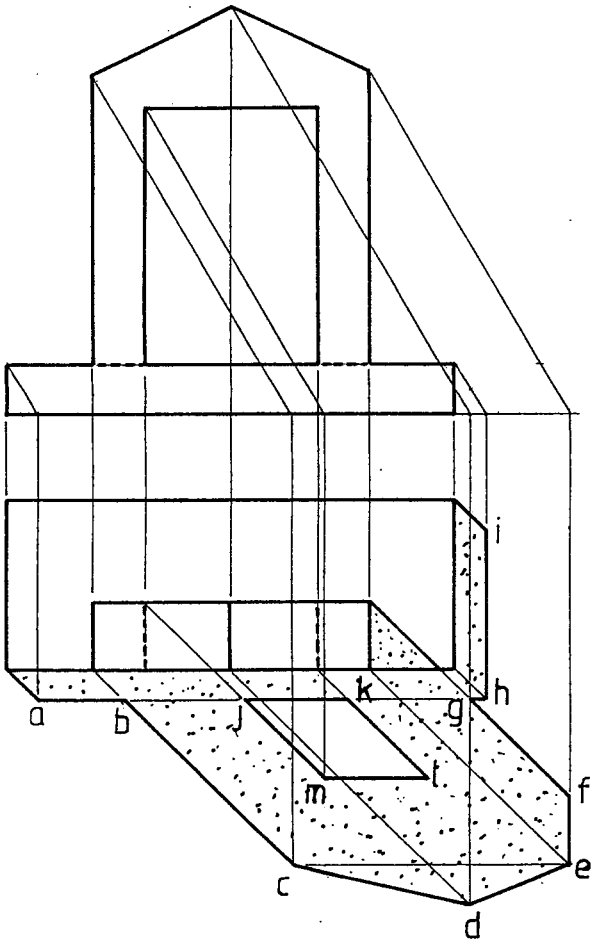
(4) 6 ---- Determine points j, k, l, m on ground (1, 1, 2, 2)

(5) 12 ---- Complete shadow cast by structure on ground (12 x1)

(6) 2 ---- Indicate shadow cast on plan of structure

(7) 4 ---- Presentation

Total 50



QUESTION 4

Marks

Plan and Elevation

(1) 6 ---- Draw the given plan, including elements

(2) 4 ---- Draw outline elevation

(3) 8 ---- Draw elements in elevation

Curvature along line BD

(4) 4 ---- XY line parallel to BD, projections at right angles (2, 2)

(5) 5 ---- Determine heights from elevation, measure in auxiliary view (3, 2)

(6) 4 ---- Draw true shape of section

Auxiliary View

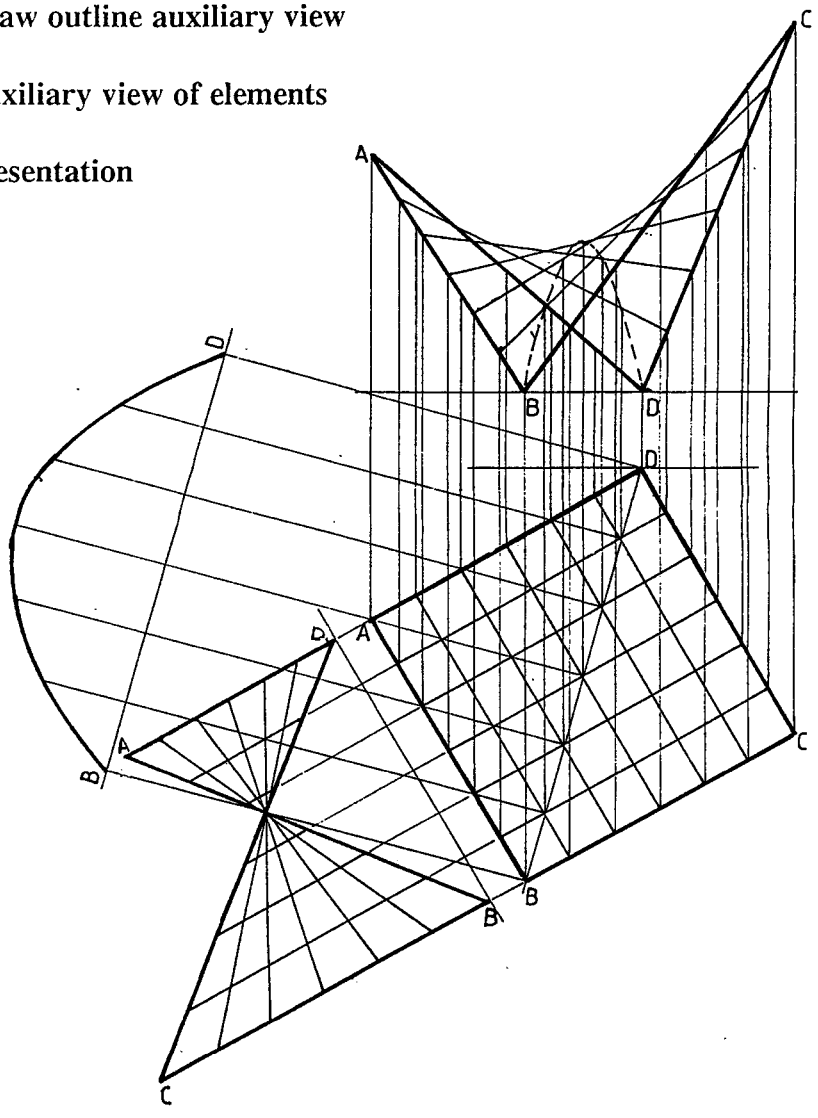
(7) 4 ---- XY line parallel to AB, projections at right angles (2, 2)

(8) 4 ---- Draw outline auxiliary view

(9) 6 ---- Auxiliary view of elements

(10) 5 ---- Presentation

Total 50



QUESTION 5

Marks

(1) 8 ---- Draw outline isometric view of rectangular portion of main building

(2) 6 ---- Construction for roof in isometric, draw isometric view of roof (2, 4)

(3) 3 ---- Draw circle and appropriate grid in orthographic (1, 2)

(4) 4 ---- Set up grid for top of cylinder in isometric

(5) 2 ---- Draw circle in isometric

(6) 4 ---- Construction for determining curve of intersection of cylinder with roof

(7) 4 ---- Draw curve of intersection and complete cylinder in isometric (2, 2)

(8) 2 ---- Construction to determine apex of cone in isometric

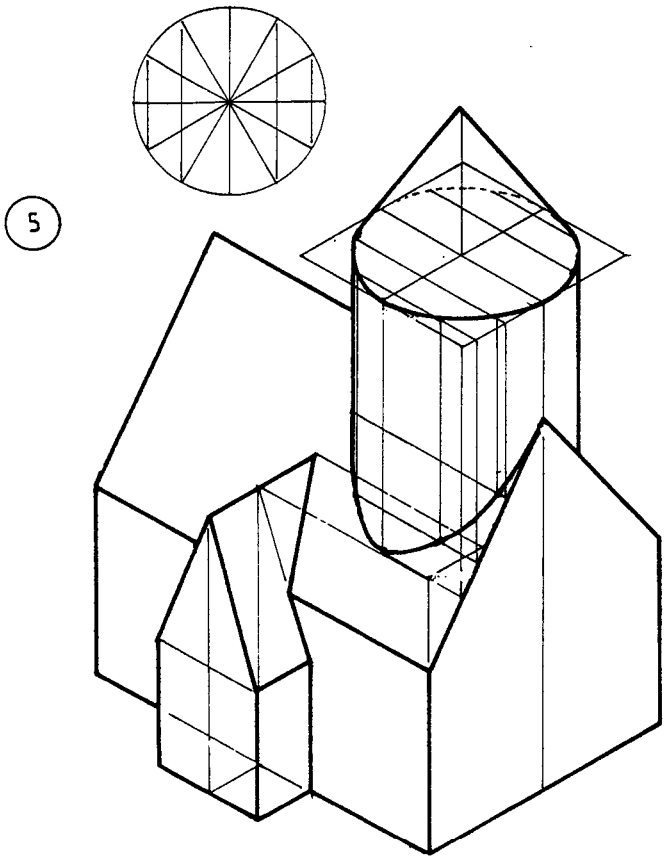
(9) 2 ---- Complete isometric view of conical surface

(10) 3 ---- Draw walls of porch in isometric

(11) 3 ---- Construction to determine lines of intersection of porch with main roof

(12) 4 ---- Complete roof of porch in isometric

(13) 5 ---- Presentation



QUESTION 6

Marks

(1) 6 ---- Draw base and throat circles in plan, axes and proj. of circles in elev. (3, 3)

(2) 3 ---- Any tangent to throat circle in plan

(3) 3 ---- Establish asymptotes in elevation (elements tang. to circle in plan)

(4) 4 ---- Horizontal sections in plan (proj. of elements to elevation)

(5) 5 ---- Establish points on curves A and B in elevation (elevtion of elements)

(6) 4 ---- Draw curves A and B in elevation (highlight curves)

(7) 3 ---- Determine diameter at top, complete plan (2, 1)

(8) 4 ---- Method for determining curves C and D in elevation

(9) 4 ---- Draw curves C and D in elevation (2, 2)

Dome

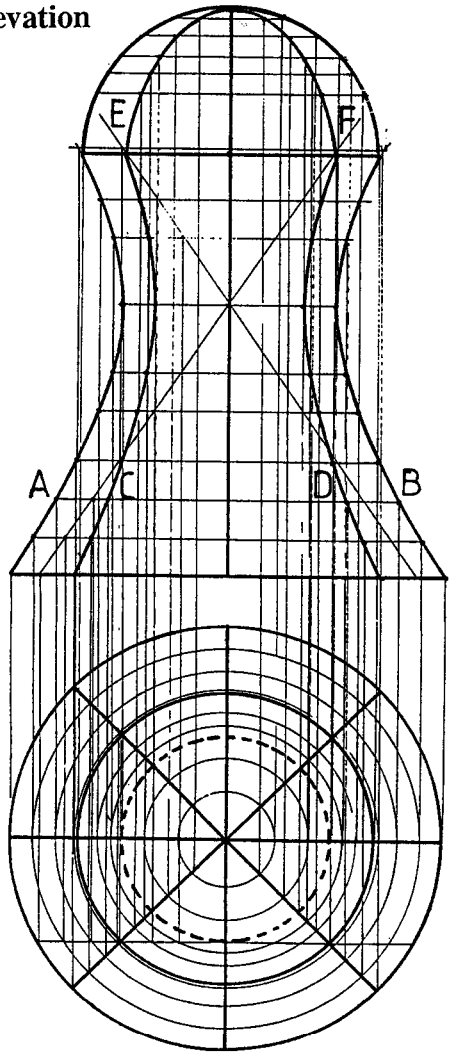
(10) 2 ---- Draw hemisphere in elevation

(11) 4 ---- Method for determining points on curves E and F in elevation

(12) 3 ---- Complete elevation

(13) 5 ---- Presentation

Total 50



QUESTION 7

Marks

Profile

(1) 6 ---- Measure heights, draw horizontal section lines

(2) 6 ---- Projections from intersections of line DE with contours to profile

(3) 6 ---- Draw outline of profile

Dip and Strike

(4) 3 ---- Join points A, B and C in plan

(5) 4 ---- Draw triangle in elevation

(6) 2 ---- Horizontal line in elevation

(7) 4 ---- Strike in plan

(8) 2 ---- New XY line, viewing direction for dip

(9) 2 ---- Determine dip

Outcrop

(10) 3 ---- Contour sections in auxiliary elevation

(11) 3 ---- Projections of intersections with stratum to ground contours

(12) 4 ---- Draw outline of outcrop

(13) 5 ---- Presentation

Total 50