

Contents

✓1. DRAWING INSTRUMENTS AND THEIR USES

1—10

- 1.1 Introduction
- 1.2 List of Draughting Tools
- 1.3 Drawing Board
- 1.4 Mini-Draughter
- 1.5 Small Instrument Box
- 1.6 Set Squares
- 1.7 Set of Scales
- 1.8 Protractor
- 1.9 French Curves
- 1.10 Drawing Sheets
- 1.11 Drawing Pencils
- 1.12 Paper Fasteners
- 1.13 Sand Paper Pad
- 1.14 Eraser
- 1.15 Duster
- Exercises
- Objective Questions

✓2. LINES, LETTERING AND LAYOUT OF SHEET

11—19

11—19

- 2.1 Introduction
- 2.2 Lines
- 2.3 Lettering
- 2.4 Single Stroke Letters
- 2.5 Gothic Letters
- 2.6 General Proportions of Letters
- 2.7 Drawing Sheet Layout
- 2.8 Title Block
- Exercises
- Objective Questions

✓3. PRINCIPLES OF DIMENSIONING

20—29

20—29

- 3.1 Introduction
- 3.2 Types of Dimensions
- 3.3 Elements of Dimensioning
- 3.4 Execution of Dimensions
- 3.5 Placing of Dimensions
- 3.6 Methods of Dimensioning
- 3.7 Principles of Dimensioning
- Exercises
- Objective Questions

✓4. SECTIONS AND CONVENTIONS

30—42

30—42

- 4.1 Introduction
- 4.2 Cutting Plane or Sectional Plane
- 4.3 Section Lines or Hatching Lines
- 4.4 Types of Section

- 4.5 Conventions for Various Materials
- 4.6 Conventional Breaks
- 4.7 Conventional Representation of Common Features
- Exercises
- Objective Questions

43—55

5. GEOMETRICAL CONSTRUCTIONS

- 5.1 Introduction
- 5.2 To Bisect a Straight Line
- 5.3 To Divide a Line
- 5.4 To Draw a Line Parallel to a Given Straight Line
- 5.5 To Bisect an Angle
- 5.6 To Find the Centre of an Arc
- 5.7 To Construct Equilateral Triangles
- 5.8 To Construct Squares
- 5.9 To Construct Regular Polygons
- 5.10 To Draw Tangents
- 5.11 Inscribed Circles
- Exercises
- Objective Questions

6. SCALES

56—79

- 6.1 Introduction
- 6.2 Representative Fraction or Scale Factor
- 6.3 Scales on Drawings
- 6.4 Types of Scales
- 6.5 Plain Scales
- 6.6 Diagonal Scales
- Exercises
- Objective Questions

7. ORTHOGRAPHIC PROJECTIONS

80—85

- 7.1 Introduction
- 7.2 Methods of Projections
- 7.3 Planes of Projection
- 7.4 Four Quadrants
- 7.5 First Angle Projection
- 7.6 Third Angle Projection
- 7.7 Symbols Used for First Angle and Third Angle Projection Method
- Exercises
- Objective Questions

8. PROJECTIONS OF POINTS

86—96

- 8.1 Introduction
- 8.2 A Point is Situated in the First Quadrant
- 8.3 A Point is Situated in the Second Quadrant
- 8.4 A Point is Situated in the Third Quadrant
- 8.5 A Point is Situated in the Fourth Quadrant
- 8.6 Special Cases

8.7 A Point is Situated in the Three Planes of Projection

- (a) A Point is Situated in the First Octant
- (b) A Point is Situated in the Seventh Octant

Exercises

Objective Questions

9. PROJECTIONS OF LINES

97—150

9.1 Introduction

9.2 Position of a Straight Line

9.3 Line Parallel to Both HP and VP

9.4 Line inclined to One Planes and Parallel to Other

- (a) Line inclined to the HP and Parallel to the VP
- (b) Line inclined to the VP and Parallel to the HP

9.5 Line Perpendicular to One of the Planes

- (a) Line Perpendicular to the HP
- (b) Line Perpendicular to the VP

9.6 Line Contained by One or Both of the Principal Planes

- (a) Line Contained by the HP
- (b) Line Contained by the VP
- (c) Line Contained by Both HP and VP

9.7 Line inclined to Both HP and VP

9.8 Line Contained by the Profile Plane (PP) or Line Contained by a Plane

9.9 Traces of A Line

Additional Problems

Exercises

Objective Questions

10. PROJECTIONS OF PLANES

151—185

10.1 Introduction

10.2 Types of Planes

10.3 Traces of Planes

10.4 A Secondary Plane in Different Positions with Respect to the Principal Planes

10.5 Projections of Plane Parallel to One of the Principal Planes

- (a) When the Plane is Parallel to the HP
- (b) When the Plane is Parallel to the VP

10.6 Projections of Plane Perpendicular to Both HP and VP

10.7 Projections of Planes Inclined to One of the Principal Planes and Perpendicular to the Other Plane

- (a) Plane inclined to the HP and Perpendicular to the VP
- (b) Plane inclined to the VP and Perpendicular to the HP

10.8 Projections of Plane Inclined to the Both the Principal Planes

Additional Problems

Exercises

Objective Questions

11. AUXILIARY PROJECTIONS

186—202

11.1 Introduction

11.2 Types of Auxiliary Planes and Views

11.3 Projections of Points

11.4 Projections of Straight Lines

- 11.5 Projections of Planes
- 11.6 Shortest Distance between Two Skew Lines
- Additional Problems
- Exercises
- Objective Questions

12. PROJECTIONS OF SOLIDS

- 12.1 Introduction
- 12.2 Types of Solids
- 12.3 Projections of Solids in Different Positions
- 12.4 Axis Perpendicular to One of the Principal Planes and Parallel to the Other
- 12.5 Axis Parallel to both HP and VP
- 12.6 Axes Inclined to One of the Principal Planes and Parallel to the Other
 - (a) Axis Inclined to HP and Parallel to the VP
 - (b) Axis Inclined to VP and Parallel to the HP
- 12.7 Axes Inclined to Both HP and VP
- Additional Problems
- Exercises
- Objective Questions

13. SECTIONS OF SOLIDS

- 13.1 Introduction
- 13.2 Section Planes
- 13.3 Sections
- 13.4 Frustum of a Solid and a Truncated Solid
- 13.5 Classification of Sections of Solids
- 13.6 Section Plane Parallel to the HP
- 13.7 Section Plane Parallel to the VP
- 13.8 Section Plane Perpendicular to the VP and Inclined to the HP
- 13.9 Section Plane Perpendicular to the HP and Inclined to the VP
- 13.10 Section Plane Perpendicular to Both HP and VP
- Additional Problems
- Exercises
- Objective Questions

14. DEVELOPMENT OF SURFACES

- 14.1 Introduction
- 14.2 Methods of Development
- 14.3 Parallel Line Method
- 14.4 Radial Line Method
- 14.5 Triangulation Method
- 14.6 Approximate Method
- Additional Problems
- Exercises
- Objective Questions

15. INTERSECTION OF SURFACES

- 15.1 Introduction
- 15.2 Methods of Determining line of Intersection
- 15.3 Intersection of Two Prisms

203—279

280—329

330—390

391—416

- 15.4 Intersection of Cylinder and Cylinder
- 15.5 Intersection of Cylinder and Prism
- 15.6 Intersection of Cylinder and Cone
- 15.7 Intersection of Cone and Prism
- Additional Problems
- Exercises
- Objective Questions

16. ISOMETRIC PROJECTION

417—451

- 16.1 Introduction
- 16.2 Classifications of Pictorial Drawings
- 16.3 Axonometric Projection
- 16.4 Isometric Projection
- 16.5 Terms Connected with Isometric Projection
- 16.6 Isometric Scale
- 16.7 Isometric Drawing
- 16.8 Isometric Dimensioning
- 16.9 Hidden and Centre Lines on an Isometric Projection
- 16.10 Isometric Drawing or Isometric Projection of Plane Figure
- 16.11 Isometric Drawing or Isometric Projections of Prisms, Pyramids, Cylinders and Sphere
- 16.12 Isometric Projection of Sphere
- Additional Problems
- Exercises
- Objective Questions

17. CONVERSION OF PICTORIAL VIEWS INTO ORTHOGRAPHIC VIEWS

452—475

- 17.1 Introduction
- 17.2 Direction of Sight
- 17.3 Orthographic Views
 - (i) First Angle Projection Method
 - (ii) Third Angle Projection Method
- 17.4 Spacing of Views
- 17.5 Procedure for Preparing Orthographic Views
- 17.6 Identification of Surfaces
- 17.7 Missing Lines
- Exercises
- Objective Questions

18. FREEHAND SKETCHING

476—482

- 18.1 Introduction
- 18.2 Sketching Materials
- 18.3 Uses of Sketches
- 18.4 Sketching Straight Lines
- 18.5 Sketching Circles
- 18.6 Sketching an Ellipse
- 18.7 Sketching Arcs and Curves
- 18.8 Sketching Angles
- 18.9 Types of Freehand Sketches
- 18.10 Sketching Orthographic Views

18.11 Sketching Isometric Views

Exercises

Objective Questions

483—518

19. COMPUTER GRAPHICS

19.1 Introduction

19.2 Computer Graphics

19.3 Requirements of Computer Graphics

19.4 Getting Started with AutoCAD

19.5 Saving a Drawing

19.6 Command Entry

19.7 Drawing Limits

19.8 Units

19.9 Draw Commands

19.10 Modify Commands

19.11 More Advanced Commands

Exercises

Objective Questions