This book aims at presenting the topics of Airport Engineering written in a simple manner. The subject-matter is characterized by comprehensive as well as methodical and easy-to-follow style, reflecting the latest FAA, ICAO, IATA and AAI recommendations and guidelines. Latest technique of GPS air traffic control has been highlighted in detail. Modern concept of Free Flight is also added.

The outline of the book is:

Chapter 1: Introduction to the subject of Airport Engineering, Airport terminology, Open skies policy and more.
Chapter 2: Explains Airport Survey
Chapter 3: Discuss Airport Planning
Chapter 4: Elucidates Planning and Design of Terminal Area
Chapter 5: Gives main aspects connected with the Runway Design.
Chapter 6: Gives features associated with Taxiway Design
Chapter 7: Newly added chapter on Aviation Fuel
Chapter 8: Gives aspects and various methods of the Airport Pavement Design
Chapter 9: Gives topics on Airport Grading and Drainage
Chapter 10: Explains Visual Aids required for aircraft
Chapter 11: Describes Air Traffic Control (ATC) systems
Chapter 12: Discuss topics on Heliports and Stolports

The text-matter has been arranged systematically into Twelve Chapters and various complicated topics are explained in lucid language assisted by:

114 Self-explanatory and neatly drawn sketches;
21 Illustrative problems;
35 Important useful tables;
254 Typical questions at the end of the chapters.

The book should prove to be extremely useful to the Civil Engineering students preparing for the Degree Examinations of all the Indian Universities, Diploma Examinations conducted by various Boards of Technical Education, Certificate Courses as well as for the A.M.I.E., U.P.S.C., G.A.T.E., I.E.S. and other similar competitive and professional examinations. It should also prove of interest to the practising professionals.
Chapter 1 INTRODUCTION

1-1. General
   (1) Collective demand
   (2) Efficient and adequate supply
   (3) Power of discrimination

1-2. Significance of transport

1-2-1. Economic significance of transport
   (1) Agriculture
   (2) Competition
   (3) Consumption
   (4) Distribution
   (5) Exchange
   (6) Industrial development
   (7) Land utilization

1-2-2. Political significance of transport
   (1) National defence
   (2) National unity

1-2-3. Social significance of transport
   (1) Concentration of population
   (2) Elimination of cottage scale production
   (3) Loss of distinguishing characteristics
   (4) Mass destruction
   (5) Restrictions on international transport

1-3. Modes of transport
   (1) Land transport
   (2) Water transport

1-4. History of aviation

1-5. Air transportation in India
   (1) Indian Airlines Corporation
   (2) Air India International Corporation

1-6. International airport authority of India (IAAI)

1-7. Civil aviation department

1-8. Airport authority of india (AAI)

1-9. Open skIES policy

1-10. Airport terminology

1-11. Component parts of aeroplane
   (1) Engine
   (2) Flaps
   (3) Fuselage
   (4) Propeller

Questions 1

Chapter 2 AIRPORT SURVEYS

2-1. General

2-2. Objects of surveys

2-3. Types of surveys

2-4. Drawings to be prepared

Questions 2

Chapter 3 AIRPORT PLANNING

3-1. General

3-2. Improvement of existing airport
   (1) Capacity of existing airport
   (2) Improving the existing capacity
   (3) Traffic forecast
   (4) Planning a new airport

3-3. Airport site selection

3-4. Airport capacity

3-5. Airport size

3-6. Forecasting in aviation

3-7. Airport obstructions

Questions 3

Chapter 4 AIRPORT ENGINEERING

DETAILED CONTENTS

1-12. Aircraft characteristics
   (1) Aircraft capacity
   (2) Aircraft speed
   (3) Aircraft weight and wheel arrangement
   (4) Fuel spilling
   (5) Jet blast
   (6) Minimum circling radius
   (7) Take off and landing distances
   (8) Noise
   (9) Range
   (10) Size of aircraft
   (11) Tyre pressure and contact area
   (12) Type of propulsion
   (13) Tyre pressure and contact area

1-13. Characteristics of the jet aircraft
   (1) Channelization
   (2) Fuel spilling
   (3) High-pressure tyres
   (4) High velocities
   (5) Hot blasts
   (6) Noise
   (7) Porpoising effect
   (8) Pumping of the joints
   (9) Sucking effect

Questions 1

Chapter 2 AIRPORT SURVEYS

2-1. General

2-2. Objects of surveys

2-3. Types of surveys

2-4. Drawings to be prepared

Questions 2

Chapter 3 AIRPORT PLANNING

3-1. General

3-2. Improvement of existing airport
   (1) Capacity of existing airport
   (2) Improving the existing capacity
   (3) Traffic forecast
   (4) Planning a new airport

3-3. Airport site selection

3-4. Airport capacity

3-5. Airport size

3-6. Forecasting in aviation

3-7. Airport obstructions

Questions 3

Chapter 4 AIRPORT ENGINEERING

DETAILED CONTENTS

1-12. Aircraft characteristics
   (1) Aircraft capacity
   (2) Aircraft speed
   (3) Aircraft weight and wheel arrangement
   (4) Fuel spilling
   (5) Jet blast
   (6) Minimum circling radius
   (7) Take off and landing distances
   (8) Noise
   (9) Range
   (10) Size of aircraft
   (11) Tyre pressure and contact area
   (12) Type of propulsion
   (13) Tyre pressure and contact area

1-13. Characteristics of the jet aircraft
   (1) Channelization
   (2) Fuel spilling
   (3) High-pressure tyres
   (4) High velocities
   (5) Hot blasts
   (6) Noise
   (7) Porpoising effect
   (8) Pumping of the joints
   (9) Sucking effect

Questions 1
8-7. Load classification number (LCN) method of pavement design
   (1) LCN for flexible pavement
   (2) LCN for rigid pavement
8-8. Design of overlay pavements
   (1) Design of flexible overlay
   (2) Design of rigid overlay
8-9. Causes of failure of pavements
   (1) Failures in flexible pavements
   (2) Failures in rigid pavements
8-10. Typical flexible pavement failures
   (1) Alligator or map cracking
   (2) Consolidation of pavement layers
   (3) Formation of waves
   (4) Frost heaving
   (5) Lack of binding with the lower course
   (6) Longitudinal cracking
8-11. Typical rigid pavement failures
   (1) Mud pumping
   (2) Scaling of cement concrete
   (3) Shrinkage cracks
   (4) Warping cracks
8-12. Maintenance and evaluation of airport pavements
8-13. Aircraft-pavement classification number system
8-14. Joints in cement concrete pavements
   (1) Reasons for providing joints
   (2) Requirements of a good joint
   (3) Transverse joints
8-15. Joint fillers and sealers
8-16. Pumping
8-17. Pavements for light aircraft
   (1) Flexible pavement
   (2) Rigid pavement
8-18. Airport pavement design softwares
   (1) Ledfaa software
   (2) Fairfield software
8-19. Icao guideline for runway layout
8-20. Geosynthetic materials for airport pavements
   (1) Secugrid
   (2) Carbofol
   (3) Secutex

Questions 8

Chapter 9 AIRPORT GRADING AND DRAINAGE
9-1. General
9-2. Importance of grading
9-3. General requirements of grading
   (1) Cuts and fills
   (2) Drainage
   (3) Equipment
   (4) Grade lines
9-4. Operations of grading
9-5. Earthwork computations
   (1) Cross-sectional method
   (2) Mass-haul curve method
9-6. Aims of airport drainage
9-7. Functions of airport drainage
9-8. Special characteristics of airport drainage
9-9. Basic requirements of airport drainage system
   (1) Capacity
   (2) Future expansion
9-10. Surface drainage
   (1) Objectives of surface drainage
   (2) Time of concentration
9-11. Ponding
   (1) Meaning of the term
   (2) Necessity
   (3) Importance
9-12. Sub-surface drainage
   (1) Functions of sub-surface drainage
   (2) Changes in moisture content
   (3) Base course and subgrade drainage
   (4) Intercepting drainage
   (5) Drainability of soils
   (6) Methods of sub-surface drainage
9-13. Types of pipes
   (1) Bell and spigot pipes
   (2) Perforated pipes
9-14. Filter materials

Questions 9

Chapter 10 VISUAL AIDS
10-1. General
10-2. Requirements of pilots for visual aids
   (1) Daytime with clear weather
   (2) Night and daytime with bad weather
10-3. Airport markings
   (1) Apron marking
   (2) Landing direction indicator
   (3) Runway marking
10-4. Guidance to pilots during landing
   (1) Alignment guidance
   (2) Height information
10-5. Factors affecting airport lighting
10-6. Elements of airport lighting
   (1) Airport beacon
   (2) Approach lighting
   (3) Apron and hangar lighting
   (4) Boundary lighting
   (5) Lighting of landing direction indicator
   (6) Lighting of wind direction indicator
10-7. Other associated visual aids

Questions 10

Chapter 11 AIR TRAFFIC CONTROL
11-1. General
11-2. Importance of air traffic control
11-3. Flight rules
   (1) Meaning
   (2) Principle
11-4. Air traffic control network
   (1) Control centres
   (2) Control towers
11-5. Air traffic control aids
   (1) En route aids or airway aids
   (2) Landing aids or terminal aids
11-6. Automation in air traffic control aids
11-7. Air Traffic Control by Global positioning system (GPS)
11-8. Free flight air traffic control

Questions 11

Chapter 12 HELIPORTS AND STOLPORTS
12-1. General
12-2. Advantages of helicopters
   (1) Bad weather
   (2) Future prospects
   (3) Military operation
12-3. Characteristics of helicopter
   (1) Flight characteristics
   (2) Physical characteristics
12-4. Planning of heliports
   (1) Selection of site
   (2) Size of landing area
   (3) Orientation of landing area
   (4) Terminal area
12-5. Elevated heliports
12-6. Heliports at airports
12-7. Characteristics of stol aircraft
12-8. Advantages of stol aircraft

Questions 12

Appendix: AIR TRAFFIC CONTROL
INDEXI