



# HIGHWAY ENGINEERING

By  
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## ABOUT THE BOOK

This text-book deals with the design methods of construction, planning, alignment and maintenance of all types of highways; and various other topics such as traffic management, road making machineries, drainage, arboriculture and lighting, highway economics, etc. connected with the subject of Highway Engineering.

The book is divided into sixteen well-arranged chapters: *therein it contains* –

- \* 280 Self-explanatory and neatly drawn sketches
- \* 31 Illustrative problems
- \* 54 Important tables
- \* 316 Typical questions at the end of each chapter.

*The salient features of the book are:*

- \* Comprehensive presentation
- \* Clear exposition and brief description
- \* Step-by-step treatment
- \* Simple and lucid language.

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.

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- 15-10. Cost considerations of highway lighting
  - (1) Design variables
  - (2) Roadway variables

- (3) Miscellaneous variables
- (1) Design variables
- (2) Roadway variables
- (3) Miscellaneous variables

#### QUESTIONS 15

### Chapter 16 HIGHWAY ECONOMICS

- 16-1. General
- 16-2. Qualifications of an administrator
- 16-3. Economics and economy
- 16-4. Engineering economy
- 16-5. Principles of economic analysis
  - (1) Analyse all the alternatives
  - (2) Analyse with and without the proposed project
  - (3) Compare alternatives by their differences
  - (4) Consider all consequences
  - (5) Discount all costs and returns to same time period
  - (6) Disregard past investments
  - (7) Ignore the method of financing
  - (8) Use the same analysis period for each alternative
- 16-6. Application of economic analysis to highways
  - (1) Project evaluation
  - (2) Project formulation
- 16-7. Methods of economic analysis
  - (1) Equivalent uniform annual cost method (EUAC)
  - (2) Present worth of costs method (PWOC)
  - (3) Equivalent uniform annual net return method (EUANR)
  - (4) Net present value method (NPV)
  - (5) Benefit/cost ratio method (B/C)
  - (6) Rate of return method (ROR)
  - (7) Cost effectiveness method (CE)
- 16-7-1. Points to be remembered for economic analysis
- 16-7-2. Choice of method for economic analysis
  - (1) Character of the proposed project
  - (2) Experience of the analyst
  - (3) Necessity of decision maker
- 16-8. Highway costs and consequences
- 16-8-1. Highway costs
- 16-8-2. Highway consequences
  - (1) User consequences
  - (2) Non-user consequences
- 16-9. Highway finance
- 16-10. Highway administration

#### QUESTIONS 16

### Appendix A TYPICAL TRAFFIC SIGNS

- A-1. Mandatory/regulatory signs
  - (1) Stop and give way signs
  - (2) Prohibitory signs
  - (3) No parking and no stopping signs
  - (4) Speed limit and vehicle control signs
  - (5) Restriction ends sign
  - (6) Compulsory direction control and other signs
- A-2. Typical cautionary/warning signs
- A-3. Informatory signs
  - (1) Direction and place identification signs
  - (2) Facility information signs
  - (3) Other useful information signs
  - (4) Parking signs
- A-4. Traffic Lights

### Appendix B ABBREVIATED TERMS

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