

TRANSPORTATION ENGINEERING

Paper Code: ETEN-312

Paper: Transportation Engineering

L	T/P	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: To give an overview of Transportation Engineering, basic characteristics of Transportation planning, construction techniques, Highway alignment and design and basic parameter of Traffic Engineering.

UNIT I

Highway Development and Alignment : Road development and planning in India, Role of NHAI, Classification of roads, Types of road pattern, Planning and Engineering surveys, Highway alignment, Highway project financing and economics of Urban roads, expressways, national and state highways.

Highway Geometric Design: Cross section, elements, width, camber, gradient, sight distance, requirements and design principles of horizontal and vertical alignment.

[T1, T2][No. of Hours: 11]

UNIT II

Traffic Engineering: Traffic characteristics and operations, traffic control devices, Traffic Studies including air pollution and their presentation, Traffic Signals, design of traffic signals, Parking requirements and design, Traffic planning and Administration. Introduction to Intelligent Transport System (ITS)

Delhi Metro project: Salient features of design, Construction, Operation and maintenance.

[T1, T2][No. of Hours: 10]

UNIT III

Highway Materials Construction, Technique and Quality Control: Properties of subgrade and pavement component materials, Tests on sub grade soil, aggregates and bituminous materials, Bituminous paving mixes, Marshall Mix design criteria. Use of flyash, Concrete and polymers in highway construction. Techniques of construction of rural and urban roads and expressways, Joints in cement concrete pavements, Road construction in water logged areas, Construction of hill roads.

[T1, T2][No. of Hours: 11]

UNIT IV

Highway Drainage: Surface and sub surface drainage, Drainage of slopes and erosion control.

Transportation Planning and Management: Urban Travel characteristics, Travel demand, Estimation, Forecasting methods and models, Trip Generation methods, Trip distribution – growth factor methods.

[T1, T2][No. of Hours: 12]

Text Books:

[T1] Khanna and Justo, “Highway Engineering”, Nem Chand and Bros. Publishers, Roorkee.

[T2] Chandola S.P., “Transportation Engineering”, S. Chand Publication, New Delhi.

Reference Books:

[R1] Vuchic V.R., “Urban Public Transportation Systems and Technology”, PHI Learning (P) Ltd.

[R2] Corney D., “Design and Performance of Road Pavements”, Tata McGraw Hill Education (P) Ltd.

[R3] Chakroborty P., Das A., “Principles of Transportation Engineering”, PHI Learning (P) Ltd.

[R4] Khisty C.J., “Transportation Engineering”, PHI Learning (P) Ltd., New Delhi.