

Hall Ticket No.

Question Paper Code: ACE013



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## MODEL QUESTION PAPER-I

B.Tech VI Semester End Examinations (Regular), May – 2019

Regulations: IARE-R16

### TRANSPORTATION ENGINEERING

(Civil Engineering)

**Time: 3 hours**

**Max. Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

#### UNIT-I

1. (a) What is the Necessity for highway planning in our country? Explain in detail about various road development plans? [7M]
- (b) Explain the significance of central road research institute and central road fund? [7M]
2. (a) Discuss the basic requirements of an ideal alignment? What are the various factors controlling alignment? [7M]
- (b) What are the economic and financial studies to be carried out in highway planning? Describe various drawings and reports to be analyzed in highway project? [7M]

#### UNIT-II

3. (a) Derive an expression for stopping sight distance, intermediate sight distance and overtaking sight distance with the help of neat sketches? [7M]
- (b) Derive the expression for super elevation, summit and valley curves with the help of neat sketches? [7M]
4. (a) Write about Design of Transition curves in detail? Explain the concept of shift? [7M]
- (b) Explain the factors on which overtaking sight distance depends. Mention various types of gradients? [7M]

#### UNIT-III

5. (a) Describe various types of traffic signs used in traffic control and regulation giving at least two examples for each type. Support your answer with suitable sketches and specifications for the signs [7M]
- (b) What are the enforcement measures to reduce accident rates? Explain various safety measures to be taken to prevent accidents at Rotary. [7M]
6. (a) What are the basic forms of Intersection and explain each with two types? [7M]
- (b) What are the requirements of at grade Intersection and explain them in detail along with sketches. [7M]

#### UNIT-IV

- 7 (a) List the advantages and disadvantages of rotary intersection? Mention various differences between channelized and un-channelized intersection? [7M]
- (b) Explain in detail about on street parking? Explain in detail about off street parking? [7M]
- 8 (a) Explain the design factors considered in rotary intersection and mention in detail of rotary design? [7M]
- (b) What are various types of Grade separated Intersections and explain them with neat sketches? [7M]

#### UNIT – V

- 9 (a) What do you mean by surface dressing and what is the role of surface dressing in the construction of highway? [7M]
- (b) Explain the construction of cement concrete roads? What are the general causes of pavement failures? [7M]
- 10 (a) Explain the construction of bituminous pavements? Explain the classification of road maintenance works? [7M]
- (b) Explain the construction of bituminous pavements? Mention in detail about various tests on bitumen? [7M]



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## COURSE OBJECTIVES:

The course should enable the students to:

I	Understand the importance of highway development of India and classification of roads and road patterns.
II	Design various geometric elements like curves, gradients, super elevation etc.
III	Capable of performing various traffic surveys.
IV	Analyse traffic signals intersections and road markings and their designs.

## COURSE OUTCOMES (COs):

CO 1	Understand the importance of highway development of India and classification of roads and road patterns.
CO 2	Design various geometric elements like curves, gradients, super elevation etc.
CO 3	Capable of performing various traffic surveys and study basics of traffic engineering and regulations.
CO 4	Analyse traffic signals intersections and road markings and their designs.
CO 5	Understand construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter.

## COURSE LEARNING OUTCOMES (CLOs):

ACE013.01	Understand necessity for highway planning, different road development plans.
ACE013.02	Study Classification of roads, road network patterns, highway alignment.
ACE013.03	Capable of performing various traffic surveys.
ACE013.04	Study factors affecting alignment, engineering surveys, drawing and reports, highway project.
ACE013.05	Understand Importance of geometric design.
ACE013.06	Analyze factors affecting highway geometric design. Design controls and criteria.
ACE013.07	Understand highway cross section elements including shoulder, kerb, carriageway
ACE013.08	Analyze sight distance elements, stopping sight distance, overtaking sight distance and intermediate sight distance.
ACE013.09	Analyze design of horizontal alignment, design of super elevation and extra widening
ACE013.10	Analyze design of transition curves, design of vertical alignment, gradients, and vertical curves.
ACE013.11	Study basics of traffic engineering and regulations.
ACE013.12	Predict basic parameters of traffic, volume, speed and density, traffic volume studies.
ACE013.13	Analyze Parking studies, on street and off street parking, road accidents, causes and preventive measures, accident.
ACE013.14	Study road markings, need for road markings, types of road markings, design of traffic signals, Webster method.
ACE013.15	Explain condition diagram and collision diagrams, traffic signs, types and specifications.

ACE013.16	Understand types of at grade intersections, canalization traffic islands, types of grade separated intersections, rotary intersection.
ACE013.17	Study concept of rotary, design factors of rotary, advantages and limitations of rotary intersections.
ACE013.18	Understand Highway material characterization; sub-grade soil, stone aggregate.
ACE013.19	Explain construction of water bound macadam roads, construction of bituminous pavements.
ACE013.20	Study Surface dressing, bitumen bound macadam, bituminous concrete.
ACE013.21	Study various types of bitumen materials, construction of gravel roads.
ACE013.22	Understand construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter.
ACE013.23	Analyze seal pavement failures, maintenance of highways.

### MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No	Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level	
1	a	ACE013.01	Understand necessity for highway planning, different road development plans.	CO 1	Understand
	b	ACE013.03	Study Classification of roads, road network patterns, highway alignment.	CO 1	Remember
2	a	ACE013.04	Capable of performing various traffic surveys.	CO 1	Understand
	b	ACE013.05	Study factors affecting alignment, engineering surveys, drawing and reports, highway project.	CO 1	Understand
3	a	ACE013.06	Understand Importance of geometric design.	CO 2	Understand
	b	ACE013.07	Analyze factors affecting highway geometric design. Design controls and criteria.	CO 2	Remember
4	a	ACE013.08	Understand highway cross section elements including shoulder, kerb and carriageway.	CO 2	Understand
	b	ACE013.09	Analyze sight distance elements, stopping sight distance, overtaking sight distance and intermediate sight distance.	CO 2	Understand
5	a	ACE013.10	Analyze design of horizontal alignment, design of super elevation and extra widening.	CO 3	Remember
	b	ACE013.14	Analyze design of transition curves, design of vertical alignment, gradients, and vertical curves.	CO 3	Understand
6	a	ACE013.17	Study road markings, need for road markings, types of road markings, design of traffic signals, Webster method.	CO 3	Remember
	b	ACE013.18	Study concept of rotary, design factors of rotary, advantages and limitations of rotary intersections.	CO 3	Understand
7	a	ACE013.20	Understand Highway material characterization; sub-	CO 4	Remember
	b	ACE013.21	Study Surface dressing, bitumen bound macadam, bituminous concrete,	CO 4	Understand

8	a	ACE013.21	Study various types of bitumen materials, construction of gravel roads.	CO 4	Remember
	b	ACE013.16	Understand types of at grade intersections, canalization traffic islands, types of grade separated intersections, rotary intersection	CO 4	Understand
9	a	ACE013.19	Explain construction of water bound macadam roads, construction of bituminous pavements.	CO 5	Understand
	b	ACE013.15	Explain condition diagram and collision diagrams, traffic signs, types and specifications.	CO 5	Remember
10	a	ACE013.18	Understand Highway material characterization; sub-grade soil, stone aggregate.	CO 5	Understand
	b	ACE013.23	Analyze seal pavement failures, maintenance of highways	CO 5	Remember

**Signature of Course Coordinator**

**HOD, CE**