

## ADVANCE TRANSPORTATION ENGINEERING

Time : 3 Hours

Min. Passing Marks : 24

Maximum Marks :

Instruction to Candidates :

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Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

1. (a) What are the objectives and various methods of conducting origin-destination survey? How the O-D survey data is presented. Explain with the help of sketches. [8]
- (b) Discuss in detail causes and preventive measures to reduce accidents on Indian roads. [8]

OR

1. (a) Twenty five spot speed observation were taken and were as under : 50, 40, 60, 54, 45, 31, 72, 58, 43, 52, 46, 56, 43, 65, 33, 69, 34, 51, 47, 41, 62, 43, 55, 40, 49. Calculate  
(i) Time mean speed  
(ii) Space mean speed  
and verify the relation between two. [8]
- (b) Discuss comparative merits and demerits of on-street and off-street parking. Enumerate various types of on-street parking with neat sketches. [8]

Unit-II

2. (a) What do you understand by "Linear Regression and Correlation". Discuss with an example. [6]
- (b) Following table shows the speed class and number of vehicles. Find out relative and cumulative frequency and draw curves for both the uses. [10]

Speed Class (Kmph)	No. of Vehicles
0-10	55
10-20	35
20-30	134
30-40	197
40-50	220
50-60	222
60-70	179
70-80	58

OR

2. (a) In analyzing the employment structure of households in an urban areas, in connection with a trip generation study it has been found that there are 2500 households of a 4 members in each. Find the probability that a particular household of this size has 0, 1, 2, 3 and 4 employed residents. [8]
- (b) The speed and concentration of vehicles in traffic stream were observed and the following data are obtained. [8]

Concentration (veh/km)	5	10	15	20	25	30	35	40	45	50
Speed (KPH)	72	68	61	52	47	39	32	27	20	13

Unit-III

3. (a) Why are traffic signals needed? Compare advantages and disadvantages of fixed time, vehicle actuated and semi-vehicle actuated signals.
- (b) A fixed time two phase signals is to be provided at intersection having four arms. The design-hour traffic and saturations hour flow are as under.

	North	South	East	West
Design hour Traffic	800	400	750	600
Saturation flow	2400	2000	3000	3000

The time lost per phase due to starting delay in 2 seconds. Calculate the optimum cycle time. Allocate green time to the two phases. [8]

3. (a) Describe the physical, mental and psychological characteristics of human which are important as a road user.
- (b) Why are the various parameters to be considered designing a rotary intersection? Discuss the advantages and disadvantages of rotary intersection.

Unit-IV

4. (a) How does the road marking help in control of traffic? Give different type of road markings and explain the object in brief & also of zebra line markings in detail.
- (b) Why street lighting is necessary on urban roads? Draw a neat sketch of traffic rotary and highway illumination as per IRC practice. [8]
4. (a) Write in brief about  
(i) Roadway delineator  
(ii) Speed Brakers  
(iii) Traffic Attenuators  
(iv) Peripheral parking schemes.
- (b) What are various types of islands used? Explain uses of each.

Unit-V

5. (a) What are the various ill-effects of noise pollution on human health? Explain various techniques for control of traffic noise.
- (b) Discuss the importance of road safety audit in reducing accidents on roads. Also write various steps how road safety audit is conducted.

OR

5. (a) What are the major pollutants of the exhaust gases of motor vehicles. Discuss detrimental effects of these pollutants on the environment.
- (b) Enumerate various road safety equipments and discuss how these equipments improve safety on roads.