

Code No: 126AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year II Semester Examinations, May - 2017****TRANSPORTATION ENGINEERING – I****(Civil Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) List the various types of road patterns. [2]
- b) List the various requirements of Highway Ideal Alignment [3]
- c) List the various assumptions in the analysis of safe Overtaking Sight Distance. [2]
- d) Calculate the extra width required for a two lane highway having a horizontal curve of radius 200m, if the design speed is 80 Km/h. [3]
- e) Draw a neat sketch of Condition and Collision diagram. [2]
- f) Define traffic volume and traffic density and speed. [3]
- g) List the factors to be considered in the design of intersection at grade. [2]
- h) List the various types of on street and off street parking facilities. [3]
- i) List the various tests to be conducted to evaluate the strength properties of soils [2]
- j) Differentiate between Tack Coat and Prime Coat. [3]

PART - B**(50 Marks)**

- 2.a) Discuss in detail, the various factors controlling the highway alignment with sketches.
- b) What is the necessity of Realignment? List and explain the various steps in Realignment. [5+5]

OR

- 3.a) What are the various recommendations of Jayakar Committee? How were these implemented?
- b) What are the various methods of classifying roads? Briefly outline the classification of urban roads. [5+5]

- 4.a) Explain PIEV Theory and the total reaction time of driver .
- b) Calculate the length of transition curve using the following data:
Design speed = 65 Km/h, Radius of circular curve = 220m, pavement width including extra widening = 7.5 m, allowable rate of introduction of super elevation (pavement is rotated about the centerline) is 1 in 150. [5+5]

OR

- 5.a) With the help of a neat sketch, explain the attainment of super elevation in the field.
- b) Calculate the length of vertical valley curve required between -1/30 and +1/25 grades for a speed of 80 Km/h to satisfy comfort and headlight sight distance requirements. [5+5]

- 6.a) Identify and explain by grouping the vehicular characteristics which affect the various elements of road design.
- b) Spot speed studies were carried out at a certain stretch of a highway with mixed traffic flow and the consolidated data collected are given below.

Speed range, kmph	No of vehicles observed	[5+5]
0-10	12	
10 – 20	18	
20 - 30	68	
30 - 40	89	
40 - 50	204	
50 - 60	255	
60 - 70	119	
70 - 80	43	
80 - 90	33	
90 – 100	9	

OR

- 7.a) Write a note on various road user characteristics affecting the traffic.
- b) Briefly explain the various objectives and methods of O and D studies. [5+5]
- 8.a) Briefly explain the various design factors to be considered in the design of rotary.
- b) With neat sketches, explain the Different types of traffic Islands and conflicts at Intersections. [5+5]

OR

- 9.a) List and explain the various advantages and disadvantages of Rotary.
- b) List the various advantages of at grade and Grade separated Intersections. [5+5]
- 10.a) List the specifications, materials and construction steps for laying Bituminous concrete.
- b) Explain briefly the importance and requirements of Highway Drainage. [5+5]

OR

- 11.a) Discuss the desirable properties of Coarse Aggregates. List the various laboratory test conducted to find these properties.
- b) Explain how the soils are classified based on HRB soil classification system. [5+5]

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