

Code No: 155DJ

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, February - 2022****TRANSPORTATION ENGINEERING****(Civil Engineering)****Time: 3 hours****Max. Marks: 75****Answer any five questions  
All questions carry equal marks**

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- 1.a) Briefly explain Importance of roads in India and characteristics of road transport.  
b) Explain obligatory points. With sketches, discuss how these control the alignment. [8+7]
- 2.a) What are the objects of highway geometric design? List the various geometric elements to be considered in highway design.  
b) Derive an expression for finding the stopping sight distance at level and at grades. [7+8]
- 3.a) What are the advantages and disadvantages of traffic signals?  
b) Explain traffic capacity, basic capacity, possible capacity and practical capacity. [7+8]
- 4.a) Explain briefly the test procedure of loss angel abrasion on stone aggregate.  
b) Discuss the test procedure of ductility property on bitumen. [7+8]
- 5.a) The following data was surveyed on a two lane single carriage way, initial traffic in both directions = 5000 CV/day, estimated time for completion of construction = 2 years, traffic growth rate = 7 %, vehicle damage factor = 4.0, Determine the cumulative number of standard axles to be carried during 10 years and 15 years of the design life.  
b) Briefly outline the IRC recommendation for determining the thickness of cement concrete pavement. [7+8]
- 6.a) Explain how the detailed project report preparation is done for any highway.  
b) State factors on which the overtaking sight distance depends. Explain briefly. [7+8]
- 7.a) Calculate the SSD for a design speed of 65 kmph. Assume suitable data. What are sight distance requirements at a gradient of 1 in 40?  
b) Explain briefly the various aspects investigated during parking studies. [7+8]
- 8.a) Write a short note on polymer modified bitumen binders.  
b) Calculate the stresses at interior, edge and corner regions of a concrete pavement using Westergaard's equation for the following data. Wheel load = 4100 kg, modulus of elasticity of concrete is  $3.3 \times 10^5 \text{ kg/cm}^2$ , pavement thickness is 30 cm, modulus of subgrade reaction is  $8 \text{ kg/cm}^3$ , diameter of loaded area is 25 cm, Poisson's ratio of concrete is 0.15. Assume data if any required. [7+8]

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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. [5+5]
- | Speed range, kmph | No of vehicles observed |
|-------------------|-------------------------|
| 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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**Code No: 126AE****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech III Year II Semester Examinations, May - 2016****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) Classify the road systems at regional/ national and urban level. [2]
- b) What are the factors effecting highway alignment? [3]
- c) What are the design issues in highway geometrics? [2]
- d) How do you frame design controls in geometrics of highway explain from each feature with specification? [3]
- e) What are the different traffic signs and their relevance? [2]
- f) Present different types of road markings, their specifications and their relevance. [3]
- g) Draw and explain different types of grade separated interchanges. [2]
- h) Draw typical conflict points in an intersection and suggest different types of treatments. [3]
- i) Present different types of pavement failures. [2]
- j) Draw the cross sectional view of joints and filler in concrete pavements. [3]

**PART - B****(50 Marks)**

- 2.a) Present on different road developments in India.
- b) What are the different road network patterns and explain their benefits? [5+5]

**OR**

- 3.a) Present on Engineering surveys to be conducted for highway construction.
- b) Present the different drawings to be developed for facilitating to construct a highway. [5+5]

- 4.a) Develop the equation form for super elevation design.
- b) What is the IRC suggested approach for super elevation implementation? [5+5]

**OR**

- 5.a) Develop the equation form for Extra widening at transition curve.
- b) Develop the equation forms for designing the different vertical curves. [5+5]

- 6.a) Explain the survey procedure for speed studies and present the different forms of representation.

- b) What are the different types of parking surveys and explain them in detail? [5+5]

**OR**

- 7.a) Present on accident record book and its result processing diagrams to analyze accidents.

- b) Present the design procedure of isolated traffic signal. [5+5]

- 8.a) Present the different types of islands and their functionality in reducing the conflicts.  
b) Present the design procedure of rotary as traffic Control Island. [5+5]

**OR**

- 9.a) What are the requirements of at grade intersection?  
b) Present on different types of intersections. [5+5]

- 10.a) Present the construction procedure of any black top road?  
b) Present the test procedures to characterize the highway materials? [5+5]

**OR**

- 11.a) Present the construction procedure of cement concrete road?  
b) Present the construction procedure of concrete joints? [5+5]

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