Code No: 155DJ **R18**

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 3.3×10^5 kg/cm^2 , pavement thickness is 30 cm, modulus of subgrade reaction is 8kg/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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