Total No. of printed pages = 2

CE 181504

Roll No. of candidate | | | | | | | | | | |

1/3/22 2021

B.Tech. 5th Semester End-Term Examination

CE

TRANSPORTATION ENGINEERING – I

(New Regulation & New Syllabus)

Full Marks – 70 Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *seven* (7) questions.

1. Explain the role of Transportation Engineering for overall development of an area directly and indirectly? Compare road as a mode of transportation with air and rail transportation. (10)

2. Discuss the modified road classification system recommended by the Third Twenty year Road Development Plan or the Lucknow Road Plan. (10)

3. The following are the data given:
   (a) Design speed = 80 kmph
   (b) Coefficient of friction = 0.35
   (c) Total reaction time of driver = 2.5 secs
   (d) Ascending gradient = 3.5%

   Calculate the stopping sight distance for:
   (i) Two lane road having two-way traffic, and
   (ii) Single lane road having two-way traffic. (10)

4. How can you compare the relative danger of lateral skidding and overturning of a two-wheeler vehicle with that of a four-wheeler vehicle negotiationg a horizontal curve without superelevation? Explain the equilibrium conditions of a two-wheeler vehicle for safe negotiation along a curve without superelevation. (10)

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5. A two-lane highway with a design speed of 100 kmph has a horizontal curve with a radius of 600 m. Design the rate of superelevation for mixed traffic and calculate by how much should the outer edge of the pavement be raised with respect to the inner edge. (10)

6. What is 'design vehicle' and 'design speed'? Write the IRC recommendations of design vehicle and design speed. (10)

7. (a) What is a transition curve? What are the objects of providing transition curves? (4)

   (b) What is ruling gradient on a highway? The gradient on a highway is 1 in 15. The radius of curve is 160m. After grade compensation, the grade to be provided should not be less than 4%. What is grade compensation? (2+4 = 6)

8. Explain the principle of CBR test. Calculate the total thickness of the pavement if the CBR value of the soil is 7%, the wheel load is 4100 kg and the tyre pressure is 7 kg/cm^2. (10)

9. (a) Briefly explain with neat sketches the functions of various joints needed in a cement concrete pavement. (5)

   (b) The loaded weight on the rear dual wheels of a truck is 5500 kg. The centre to centre spacing and clear space in dual wheels are 30 cm and 10 cm respectively. Calculate the ESWL for pavement thickness 40 cm. (5)

10. Name the different types of road signs and draw neat sketches of each type. (10)

11. How are spot speed studies useful? Explain the enoscope method of determining the spot speed of a vehicle. (10)