

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2023

Course: Transportation Engineering

Program: B Tech Civil Engineering

Course Code: CIVIL 3022

Nos. of page (s): 2

Semester: VI

Time: 3 hrs

Max. Marks: 100

Instructions: Assume suitable data if necessary.

SECTION A

S. No.		Marks	CO
Q 1	State comparison between Nagpur Road Plan and Bombay Road Plan.	4	CO1
Q 2	Explain in brief the significance of conducting gradation of binding material in highway construction and the gradings.	4	CO2
Q 3	Describe with neat sketch i) Kerb and ii) Width of roadway	4	CO3
Q 4	Describe four different types of gradients.	4	CO3
Q 5	Discuss in brief how the traffic is characterized for improving traffic facilities.	4	CO4

SECTION B

Q 6	Derive an expression for extra widening on horizontal curves with neat sketch.	10	CO2
Q 7	Describe how traffic volume study is conducted and its importance in traffic engineering.	10	CO2
Q 8	What are the requirements of materials, plants, and equipment for cement concrete Road construction? Discuss briefly.	10	CO3
Q 9	What are the various types of flexible pavement failures? Explain briefly. Or Explain in brief wheel load stresses and Temperature stresses in rigid pavement.	10	CO4

SECTION-C

Q 10	<p>Derive the expression of Valley curve for comfort criteria.</p> <p>The radius of a horizontal circular curve is 100 m. The design speed is 80 kmph and the design coefficient of lateral friction is 0.15. Calculate the Superelevation required if full friction is assumed to develop.</p> <p>Design a transition curve for a circular curve having a radius of 300 m in a plain terrain. It is proposed to introduce the super elevation in the 4 lane National highway having a width of 14m by rotating the alignment with reference to central line. The design speed of highway is 120 kmph. The rate of introduction of super elevation is 1 in 150.</p>	20	CO2
Q 11	<p>Explain brief design guidelines of concrete pavement as per IRC 58-2015.</p> <p>Estimate the thickness of cement concrete pavement using the method suggested by IRC. Modulus of elasticity of concrete = 3×10^5 kg/cm², Modulus of rupture of concrete = 40 kg/cm², Poisson's ratio of concrete = 0.15, Modulus of sub grade reaction = 6kg/cm², Wheel load = 5100kg, Radius of contact area = 15 cm.</p> <p>Or</p> <p>How is the surface condition of flexible and rigid pavements evaluated? What are the categories of overlay combinations?</p> <p>The spacing between the contraction joints of Cement Concrete pavement is 4.2 m. Determine the tensile stress developed in the Cement Concrete pavement due to contraction if the coefficient of friction between the bottom of the pavement and the supporting layer is 1.1 and the unit weight of Concrete is 2400 Kg/m³.</p>	20	CO4