HIGHWAY & AIRPORT ENGG (Full marks -50) Part-II EX/CON/PC/B/T/325/2023(S)

Assume relevant data wherever required

Answer any two questions.

Q-1. Write notes on the following

(a) VDF (b) Alligator cracks (c) Rutting (d) lane distribution factor (e) Burmister's theory

(5 X5 = 25)

Q-2.

(i) Explain top down and bottom up cracks in concrete road pavement. [8]

(ii) Determine the design load for a four lane multilane national highway passing through plain terrain with an initial traffic of 15A9 cvpd . [6]

(iii) Define characteristic deflection for overlay design [6]

(iv) Explain fatigue in bituminous and concrete road pavement. [5]

Q-3. (i) Determine the required thickness of concrete pavement with M30 grade concrete to withstand the wheel load stress on a sub base with modulus of subgrade reaction of 80 MPa/m .

(13)

(ii) Explain Contraction joint , expansion joint and construction joint in a concrete pavement (12)

[Turn over

Ref no: Ex/CON/PC/B/T/325/2023(S)

B.E. CONSTRUCTION ENGINEERING THIRD YEAR SECOND SEMESTER SUPPLEMENTARY EXAM 2023

Subject Code: CON/PC/B/T/325

Subject: Highway Engineering Full Marks: 50

Part –II

Instructions:
1. Answer **ANY FOUR questions.**
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

1. Describe Plate Load Test test with neat sketches. What is the significance of Plate load test? Briefly narrate significance of GI test of soil from the view point of highway material? Discuss the limitation of CBR test? 12.5
2. Explain the significance of VG grade bitumen over Penetration grade bitumen? 12.5

3. Describe Marshall Test step by step what is the significance of flow value in Marshall Test? What are the essential properties of bituminous mixes? 12.5

4. a) Write short notes on : – (**Any TWO**)
   i) Penetration test of bitumen
   ii) Flash-Point and Fire Point Test
   iii) Ring & Ball Test
   iv) Aggregate Impact and Abrasion Value

(b) The aggregates in a bituminous mix are with 11% asphalt by weight of mixture. The specific gravity of asphalt is 1.01. Compacted specific gravity of void less specimen of this mixture is 2.45. Determine the effective specific gravity of the aggregate. 12.5

5. Enumerate innovative application and advantage and disadvantage of binder modification? Prepare a check list/ scheme for the development of alternative materials to be used in highway constructions. 12.5