J-21-0006

B. Tech. EXAMINATION, 2021

Semester V (CBCS)

TRANSPORTATION ENGINEERING–I

CE-506

Time : 2 Hours   *Maximum Marks : 60*

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. Explain in detail about the conventional and modern methods of engineering surveys for deciding the best highway alignment.   **15**

2. Give a detailed classification along with rough sketches of traffic signs whilst mentioning their respective purpose. **10**

Section B

3. Calculate the length of a transition curve using the following data :

Design speed = 70 km/hr, radius of circular curve = 200 m, allowable rate of introduction of super-elevation = 1 in 150, pavement width including extra widening = 7.5 m and superelevation = 7% (rotation about center for providing superelevation). **15**

4. What factors are responsible for the design of a vertical curve at day and at night ? Provide equations for length of vertical curve. Classify vertical curves also. **15**

Section C

5. In regard to the design of rigid pavement explain the following terms : **15**

(i) Top downward cracking and bottom upward cracking

(ii) Crictical location for the design

(iii) Effective Modulus of subgrade reaction

(iv) Radius of relative stiffness

(v) Equivalent radius of resisting section.

6. Explain the difference in the structure and mechanical properties of flexible and rigid pavements. What is the mode of failure in rigid pavement and flexible pavement ? **15**

Section D

7. What are the different types of overlays ? Explain their uses and their design steps. **15**

8. What are the various parameters for the evaluation of flexible pavements ? Explain each of them in detail. **15**

(Compulsory Question)

9. Write short notes on the following : **3×5=15**

(i) Geo synthetics in pavement

(ii) Spot speed study

(iii) Types of road capacity

(iv) Origin and destination studies

(v) Nagpur Road plan.