C 3109

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Fourth Semester

Civil Engineering

CE 1255 — HIGHWAY ENGINEERING

(Regulation 2004)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the objectives of Central Road Fund?

2. What is footpath and write its standards according to Indian Roads Congress (IRC)?

3. A National Highway located in rolling terrain has a radius of 300 m. Determine the length of the transition curve making suitable assumptions.

4. What are the factors governing the super elevation of a road surface?

5. What is meant by Vehicle Damage Factor in IRC method of flexible pavement design?

6. Mention the functions of dowel bar in cement concrete pavement.

7. Define "Flakiness Index".

8. Mention the purpose of conducting softening point test for binder.

9. What do you understand by the term "mud pumping"?

10. Mention any two equipments used for the measurement of skid resistance of road surface.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the factors governing highway alignment. (10)
        (ii) Brief the elements of "Remote Sensing". (6)

Or

    (b) Explain the procedure for carrying out road alignment in a valley using GIS technique. (16)

12. (a) Describe the factors to be considered in Geometric design of cement concrete roads in built-up area. (16)

Or

    (b) Describe the factors affecting the sight distances in hill roads. (16)

13. (a) (i) Describe IRC guidelines for the design of dowel bars and tie bars in rigid pavement. (8)
        (ii) Explain the necessity for providing joints in rigid pavement. (8)

Or

    (b) With neat sketches, explain the functions of components of rigid and flexible pavements. (16)

14. (a) (i) With neat sketches, explain the test procedure for assessing polishing value of aggregate. (10)
        (ii) Discuss the significance of stone polishing value in pavement performance. (6)

Or

    (b) Explain the construction procedure for the following bituminous courses : (2 × 8 = 16)
        (i) Open graded premix carpet with seal coat type-A.
        (ii) Two coat surface dressing.

15. (a) What is International Roughness Index (IRI)? Explain its significance and procedure for measuring IRI with any standard equipment. (16)

Or

    (b) Describe the symptoms, causes and remedial measures for the following failures in six lane express way : (2 × 8 = 16)
        (i) Scaling (ii) Spalling.

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