L 1046

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

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 two major on-going road development programmes at national level in India?

2. What are the important considerations of Tresagnet technique of road construction?

3. What is meant by 'Super elevation'?

4. Calculate the value of ruling minimum radius of horizontal curve of a National Highway in plain terrain. Assume ruling design speed = 100 kmph, e = 0.07 and f = 0.15.

5. What is 'rigidity factor' in the design of highway pavements?

6. What are the two types of stresses produced by temperature in a concrete pavement?

7. Define "Flaky aggregate".

8. What is the purpose of applying tack coat in bituminous road construction?

9. What are the causes of ravelling in flexible pavements?

10. State any four types of failures in a concrete pavement.

PART B — (5 × 16 = 80 marks)

11. (i) What are the various objectives of preliminary survey for highway alignment? Enumerate the details to be collected and the various steps in the conventional method? (10)

(ii) Explain the necessity and objects of highway planning. (6)

12. (a) (i) State factors on which the overtaking sight distance depends. Explain briefly. (8)

(ii) Discuss the factors to be considered while designing the length of transition curve. (8)

Or

(b) (i) Explain the total reaction time of driver and the factors on which it depends. (8)

(ii) Explain the points to be considered for planning of hair pin bends in hill roads. (8)

13. (a) (i) Compare bituminous and concrete roads. (8)

(ii) Explain the CBR method of pavement design. Discuss the limitations of this method. (8)

Or

(b) (i) Explain ESWL and the concept in the determination of the equivalent wheel load. (8)

(ii) Explain the design consideration for spacing of expansion and contraction joints. (8)

14. (a) Explain the following aggregate tests with neat sketches. (2 × 8 = 16)

(i) Stone polishing test

(ii) Flakiness index.

Or

(b) Explain the construction of the following bituminous courses. (2 × 8 = 16)

(i) Premix carpet wearing course

(ii) Dense bituminous macadam.

16. (a) Explain the symptoms, causes and remedies suggested for the following surface defects. (2 × 8 = 16)

(i) Surface rut.

(ii) Slippery surface.

Or

(b) (i) How would you evaluate the roughness of flexible pavements? Explain. (8)

(ii) How would you calculate the thickness of bituminous overlay required over the existing bituminous pavement? (8)