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**Question Paper Code : 10223**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2012.

Fourth Semester

Civil Engineering

CE 2255/101405/CE 46/CE 1255 A/10111 CE 406/080100022 —  
HIGHWAY ENGINEERING

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the objectives of Highway Research Board?
2. State the classification of roads according to Nagpur road plan.
3. What is meant by Super Elevation?
4. Define 'Stopping Sight Distance'.
5. What is rigidity factor in the design of Highway Pavements?
6. Define 'ESWL'.
7. Define 'Softening point of bitumen'.
8. State the desirable properties of road aggregate.
9. What is meant by spalling of joint?
10. What are the causes of Scaling?

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail about second twenty year road plan. (16)

Or

- (b) Write brief notes on : (16)
- (i) Central Road Fund (CRF).
  - (ii) Indian Road Congress (IRC)
  - (iii) Central Road Research Institute (CRRI)
  - (iv) National Highway Authority of India (NHAI).

12. (a) (i) Derive the formula for calculating super elevation on horizontal curve. (8)
- (ii) Explain the factors influencing overtaking sight distance. (8)

Or

- (b) Calculate the stopping sight distance required to avoid head on collision of two cars approaching from opposite directions at a speed of 75 kmph and 85 kmph. Assume that the reaction time of drivers be 2.5 secs and coefficient between road surface and tyres be 0.4.

13. (a) (i) Differentiate between Flexible and rigid pavement. (8)
- (ii) Explain the design consideration for spacing of expansion and contraction joints. (8)

Or

- (b) Explain in detail about the IRC method of flexible pavement design. Discuss the limitation of this method. (16)

14. (a) Describe the procedure recommended by Bureau of Indian standards for carrying out the following tests. (8 + 8 = 16)
- (i) Abrasion Test
- (ii) Flash and Fire Point Test.

Or

- (b) (i) Specify the design approach for the surface drainage system of highways. (8)
- (ii) Explain the construction procedure for Bituminous concrete. (8)
15. (a) Explain any two commonly employed methods for the structural evaluation of flexible pavements. (16)

Or

- (b) (i) Explain briefly the maintenance of bituminous surface. (8)
- (ii) What is meant by rutting? Explain the symptoms, causes and treatment. (8)