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**Question Paper Code : 55244**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2011.

Fourth Semester

Civil Engineering

CE 2255 – HIGHWAY ENGINEERING

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the role of MoRTH?
2. What are BOT projects?
3. Define limiting gradient.
4. What is extra widening?
5. Define optimum moisture content.
6. What are dowel bars?
7. Differentiate between Tar and Bitumen.
8. What is Elongation Index?
9. Define pavement roughness Index.
10. What is serviceability of pavements?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the requirements of ideal highway alignment. (8)  
(ii) Explain the different components of the National Highway Development Programme (NHDP). (8)

Or

- (b) (i) Discuss how modern methods such as GIS and GPS may be used for the reconnaissance survey for highway alignment. (8)  
(ii) Draw a neat sketch and explain the cross section of an urban arterial. (8)
12. (a) (i) Compute the stopping sight distance on a highway with a design speed of 80 kph, if the highway is on an upgrade of 2%. (8)  
(ii) Outline the design elements of hill roads. (8)

Or

- (b) (i) Distinguish between overtaking sight distance and intermediate sight distance. How will you calculate these? (8)  
(ii) What is the super elevation to be provided on a horizontal curve on a National Highway in plain terrain (Hint: Design speed =100 kph), if the curve has a radius of 310 m? (8)
13. (a) (i) List the different stresses induced in cement concrete pavements. Discuss the critical combination of these stresses. (8)  
(ii) Explain the CBR method of design of flexible pavements. (8)

Or

- (b) (i) How will you calculate the Equivalent Single Wheel Load for a given combination of wheel loads?(8)  
(ii) Explain the IRC method of design of rigid pavements. (8)
14. (a) (i) Distinguish between impact and abrasion values of aggregate. How are these values measured? (8)  
(ii) What is WBM? Describe the construction procedure of a WBM road. (8)

Or

- (b) (i) Distinguish between viscosity and softening point of road bitumen. Describe their test procedures. (8)
- (ii) Discuss the importance of surface and sub-surface drainage in highways. (8)
15. (a) (i) Discuss with the help of sketches the different types of failures in flexible pavements. (8)
- (ii) Explain the procedure for the structural evaluation of pavements. (8)

Or

- (b) (i) What are the different types of failures in cement concrete pavements? (8)
- (ii) What are flexible overlays? Explain how the Benkelman Beam is used to design the thickness of the overlay. (8)

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