

Reg. No. :

Question Paper Code : 20337

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Sixth Semester

Civil Engineering

CE 8604 — HIGHWAY ENGINEERING

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the salient features of Nagpur road plan.
2. Recall the role of MORTH.
3. Define geometric design of highways.
4. What is meant by obligatory point?
5. What is meant by ESWL?
6. Mention the expression for radius of relative stiffness.
7. What are the limitations of bitumen?
8. What are the needs of recycling of pavement?
9. Define pavement roughness index.
10. What is bituminous overlay?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Examine the importance modifications made in macadam's method of construction. (7)
- (ii) Explain the procedure of reconnaissance survey. (6)

Or

- (b) (i) Narrate the various engineering surveys to determine the highway alignment. (7)
- (ii) Write a brief note of central road fund. (3)
- (iii) Summarize road ecology system. (3)
12. (a) (i) Write a note on PIEV theory. (3)
- (ii) Distinguish between overtaking sight distance and intermediate sight distance. (3)
- (iii) Summarize the procedure for calculating the length of valley curve. (7)

Or

- (b) (i) Calculate the SSD for design speed of 80 kmph for two way traffic and one way traffic road. Take reaction time as 2.5 seconds, the coefficient of friction as 0.35. (7)
- (ii) Write the factors influencing overtaking sight distance. (6)
13. (a) (i) Draw cross section of rigid pavement with their parts clearly. (4)
- (ii) Write a note on critical load position. (4)
- (iii) Explain the IRC method of design of rigid pavement. (5)

Or

- (b) (i) Find ESWL at depths of 5 cm, 20 cm and 40 cm for a dual wheel carrying 2044 kg each. The center to center tyre spacing is 20 cm and distance between walls of the two tyres is 10 cm. (8)
- (ii) Write a note on ESWL based on deflection. (5)
14. (a) (i) Differentiate flakiness index and elongation index. (5)
- (ii) Write a note of Geo-Textile and their functions. (8)

Or

- (b) What is Polymer modified bitumen? Discuss the common types of Polymers types modified bitumen.
15. (a) (i) Discuss the symptoms, causes and treatment solution for rutting. (8)
- (ii) Explain the defects and failure of pavement. (5)

Or

- (b) (i) What are the factors affecting skid resistance? (7)
- (ii) Explain the procedure to maintain a pavement. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Discuss major two engineering surveys in order to determine the highway alignment.

Or

- (b) Discuss the CBR test for subgrade.