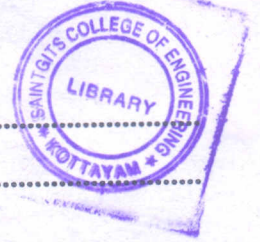F 3257

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Eighth Semester

Branch : Civil Engineering

CE 010 804 L05—HIGHWAY AND AIR FIELD PAVEMENTS (Elective III) [CE]

(New Scheme—2010 Admissions–Supplementary)

Time : Three Hours   Maximum : 100 Marks

Part A

*Answer **all** questions.*
Each question carries 3 marks.

1. What are the factors affecting stability of pavements ?

2. Explain the effect of climatic variations.

3. Define relative stiffness.

4. What is wrapping stress ?

5. Write a note on pavement instrumentation.

(5 × 3 = 15 marks)

Part B

*Answer **all** questions.*
Each question carries 5 marks.

6. Explain modulus of subgrade reaction.

7. Explain the merits and limitations of group index method.

8. Write a note on design charts.

9. Differentiate tie bars and dowel bars.

10. Describe pavement evaluation.

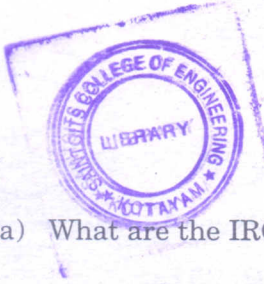(5 × 5 = 25 marks)

Part C

*Answer **all** questions.*
Each question carries 12 marks.

11. (a) Discuss the functions of various components of a flexible pavement.

Or

(b) Explain the following with respect to pavement design.

(i) Soil subgrade and its evaluation.

(ii) Sub-base and Base courses and their evaluation.

Turn over

12. (a) What are the IRC recommendations for the CBR method of design?

Or

(b) Explain group index method. A subgrade soil sample has the following properties : Soil passing through 0.0 ? 5 mm.; sieve = 60%; liquid limit = 50%; plastic limit = 43%. Design the pavement section by G.I. method. Assume heavy traffic with over 460 CVd.

13. (a) What are design considerations in rigid pavements design ? Explain the significance of radius of relative stiffness.

Or

(b) Explain the calculation of Bradbury's stress coefficients. Explain how stress at different points are calculated using Westergaards stress equations.

14. (a) Calculate the stresses at interior, edge and corner regions of a cement concrete pavement, using Westergaards stress equations. Use the following data : Wheel load = 5100 kg., Slab thickness = 18 cm. Modulus of elasticity of cement concrete = 3.0×10^5 kg./cm^2. Poisson's ratio = 0.15, Subgrade reaction= 6.0 kg./cm^3. Radius of contact area = 15 cm.

Or

(b) Explain how a bituminous pavement is structurally evaluated. Name a few instruments required for the same.

15. (a) Explain how Benkelman beam is used for the performance testing of pavements.

Or

(b) Why joints are provided in concrete pavements? What are the different types of joint ? Explain any three joints.

(5 × 12 = 60 marks)