Total No. of Questions : 8] *[Total No. of Printed Pages :2*

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CE-7004(1)-CBGS

B.E. VII Semester

Examination, June 2020

Choice Based Grading System (CBGS)

Pavement Design

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assume data suitably.

1. a) What do you mean by Equivalent Single Wheel Load (ESWL)? Explain graphical method for determination of ESWL. 7
   b) Discuss the effects of repeated application of load on pavements. Explain equivalent wheel load factors for repetition of different loads. 7

2. a) Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the functions and importance of each component of the pavement. 7
   b) Explain briefly the principle of Burmister's two-layer theory and mention the advantages over the elastic single layer theory for analysis of flexible pavements. 7

3. a) Plate bearing tests conducted on a 30 cm diameter plate yielded the following observations: 7

Load (kg)	270	580	770	1010	1260	1480	1690
Settlement(mm)	0.25	0.50	0.75	1.00	1.25	1.50	1.75

Determine the value of modulus of subgrade reaction (k) of the soil corresponding to a plate of 75 cm diameter.

b) Outline the principle of rigid pavement design using stress equations. 7

4. a) What are the steps for the thickness design of rigid pavements as per IRC Guidelines? 7
   b) Compute the radius of relative stiffness of 15cm thick cement concrete slab using the following data: 7
   Modulus of elasticity of cement concrete = 2.1×10^5 kg/cm^2
   Poisson's ratio for concrete = 0.15
   Modulus of subgrade reaction 'k' = (a) 3.0 kg/cm^3
   (b) 7.5 kg/cm^3

5. a) With a diagram explain the working of Benkelman beam for measurement of pavement deflection. 7
   b) Write explanatory notes on "Laying bituminous overlay over existing flexible pavement." 7

6. a) Describe different types of joints used in construction of rigid pavement. 7
   b) Explain CBR method for flexible pavement design. 7

7. Design the CC pavement thickness expansion and contraction joint spacing for a wheel load of 5500 kg. Assume all data suitably. 14

8. Write short notes on: 14
   a) Ravelling
   b) Rutting
   c) Corrugations
   d) Alligator cracks.

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