M.E. Second Semester (Civil Engineering (Geotechnical Engineering)) (Full Time) (C.G.S.- New)
13057 : Elective-II : Pavement Analysis and Design : 2 SFGE 5

P. Pages : 1

Time : Three Hours

0399

AW - 3655

Max. Marks : 80

Notes : 1. All question carry equal marks.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.
4. Solve **any five** questions out of six.
5. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Discuss the basic design differences between an airport and highway pavements. **8**

   b) What do you mean by 'ESWL'? How it is determine? What are factors affecting ESWL? **8**

2. a) Explain with neat sketch, the field method to determine modulus of subgrade reaction 'K'. It is correction required and its importance. **8**

   b) The load-penetration values of CBR test conducted on a soil sample are given below. Determine the average CBR value of the soil, if 10 division of the load dial represent 0.2kN in the calibration chart on proving ring. **8**

Penetration of plunger, in mm	0.0	0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0	7.5	10	12.5
Load dial reading, division	0	10	18	26	34	40	50	62	70	87	95	109

3. a) Explain the stress analysis in rigid pavement. **8**

   b) Explain in detail along with diagram and different types of joint provided in concrete pavement. **8**

4. a) Explain step by step procedure in design of flexible pavement using IRC-37-2001. **8**

   b) Enlist various design methods of flexible airfield pavement and explain any one in detail. **8**

5. a) Design a runway section for a wheel load 270kN with a tire pressure of $1100 \text{kN}/\text{m}^2$ for this purpose the plate bearing test with $75cm-\phi$ was carried out on soil subgrade and plate yielded a pressure of $200 \text{kN}/\text{m}^2$ at 0.5cm deflection after ten road repetitions. **8**

   b) Explain LCN system of rigid airfield pavement design. **8**

6. a) Why field pavement testing is necessary? Describe various field test to measure the strength of pavement. **8**

   b) Explain FAA method of design of airport flexible pavement. Determine the thickness of airport flexible pavement for an equivalent single wheel load of 40kN. The subgrade has a CBR of 5. The tyre pressure is $1.4 \text{MN}/\text{m}^2$. **8**

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