No. of Printed Pages : 4 **BICEE-018**

B.TECH. CIVIL ENGINEERING (BTCLEVI)

Term-End Examination

June, 2013

BICEE-018 : PAVEMENT EVALUATION

Time : 3 hours *Maximum Marks : 70*

Note : (i) *All answers are to be written in **English** only.*

(ii) *Answer **any seven** questions. All questions carry **equal** marks.*

(iii) *Non programmable calculators are **allowed**.*

(iv) *Graph paper may be allowed.*

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1. (a) Describe various factors affecting between pavements and tyres of vehicles. 5

   (b) What do you meant by Pavement unevenness ? What are the different factors which cause undulations on the pavement surface ? 5

2. (a) What are the advantages and disadvantages of non destructive test ? 5

   (b) Compute the radius of relative stifness of 17 cm thick concrete slab from the following data : 5

   Modulus of elasticity of cement concrete = 2,25,010 kg/cm^2.

   Poisson's ratio for concrete = 0.13

   Modulus of subgrade reaction k = (i) 4.0 kg/cm^2 (ii) 85 kg/cm^2

3. (a) Evaluate the pavement surface condition by physical measurements and also give their application. 5

(b) Explain how climatic variations affect pavement design and performance. 5

4. Benkelman beam deflection studies were carried out on 15 selected points on a stretch of flexible pavement during summer season using a dual wheel load of 4085 kg, 5.6 kg/cm^2 pressure. The deflection values obtained in mm after making the necessary leg correction are given below. If the present traffic consist of 750 commercial vehicle per day, determine the thickness of bituminous overlay required, if the pavement temperature during the test was 39°C and the correction factor for subsequent increase in subgrade moisture content is 1.3. Assume the annual rate of growth of traffic as 7.5%. Adopt IRC guidances. 10

1.40, 1.32, 1.25, 1.35, 1.48, 1.60, 1.65, 1.55, 1.45, 1.40, 1.36, 1.46, 1.50, 1.52, 1.45 mm

5. (a) Discuss the wester gaard concept and assumptions. 5

(b) Explain the necessity of design of strengthening of existing pavement for "flexible over lay over flexible pavement". 5

6. (a) Discuss the following *(any two)* 2½x2=5

(i) Pavement slipperiness

(ii) Ruts and cracks

(iii) Skidding of pavement surfaces

(b) What are the general causes of pavement failures ? 5

7. What do you understand by pavement evaluation ? What are the various approaches and methods of pavement evaluations ? 10

8. (a) A plate load test was conducted on soaked subgrade during monsoon season using a plate diameter of 30 cm. The load values corresponding to the mean settlement dial reading age given below. Determine the modulus of subgrade reaction for the standard plate 5

Mean settlement values (mm)	0.0	0.24	0.52	0.76	1.02	1.23	1.53	1.76
Load values (kg)	0.0	460	900	1180	1360	1480	1590	1640

(b) What are the various factors affecting structural condition of flexible pavement ? 5

9. Describe the overlay design method by Benkelman Beam. Write the correction for pavement temperature and subgrade moisture variations. **10**

10. Write short notes *(any two)* **5+5=10**

(a) Placement of geosynthetics in pavement overlays.

(b) Factors affacting pavement structural condition.

(c) Mud pumping.