PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M. Tech. Winter 2019 - 20 Examination

Semester: 2   Date: 17/12/2019
Subject Code: 203211153   Time: 02:00 pm to 04:30 pm
Subject Name: Pavement Design & Evaluation   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Give detailed comparison between Flexible and Rigid pavements. **(05)**

B) Explain various factors affecting pavement design. **(05)**

C) Enlist distresses in flexible pavement. **(05)**

Q.2 **Answer the following questions**. (Attempt any three) (Each five mark) **(15)**

A) Explain methods of soil stabilization.

B) Write a note on group index method for pavement design

C) Explain ESWL

D) Explain Plate load test.

Q.3 A) Explain the CBR method of flexible pavement design. What are the considerations in design of bituminous pavements as per IRC 37: 2012? **(07)**

B) Compute the radius of relative stiffness and equivalent radius of resisting section of 20 cm thick cement concrete slab from the following data: E of Cement concrete = 2.1 x 105 kg/cm2, Poisson's ratio for concrete = 0.15, Modulus of sub grade reaction = 7 kg/cm3, radius of contact area of wheel load = 15 cm. **(08)**

OR

B) Design the Tie bars for the CC pavement having following data: Slab thickness = 35 cm, Lane width = 3.5m, Coefficient of friction = 1.5, Density of concrete = 2400 kg/m3, Allowable tensile stress in plain bars = 1250 kg/cm2, Allowable bond stress = 17.5 kg/cm2, Diameter of tie bar = 12mm. Use Guidelines of IRC 58 **(08)**

Q.4 A) Discuss the importance and methods of surface drainage in pavement construction. **(07)**

OR

A) Discuss the importance and methods of sub surface drainage in pavement construction. **(07)**

B) Benkelman beam deflection studies were carried out on 10 selected points on a stretch of flexible pavement during summer season using a dual wheel load of 4085 kg, 5.5kg/cm2 pressure. The deflection values obtained in mm after making the necessary leg corrections are given below. If the present traffic consists of 1000 CV per day, determine the thickness of bituminous overlay required, if the pavement temperature during the test was 300 C and correction factor for subsequent increase in sub grade moisture content is 1.3. Assume traffic growth rate increase as 8 % and duration between last count and construction of overlay as 2 year. Assume allowable deflection = 1.0mm and equivalency factor = 2 for the bituminous concrete overlay. **(08)**

1.45, 1.30, 1.50, 1.65, 1.55, 1.48, 1.46, 1.37, 1.52, and 1.45 mm.