

Code: R7420106

R7**B.Tech IV Year II Semester (R07) Supplementary Examinations March/April 2013****PAVEMENT ANALYSIS AND DESIGN**

(Civil Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain the concept of ESWL used in pavement design.
(b) Discuss about the factors to be considered in pavement design.
- 2 (a) Explain Burmister's theory of stresses in flexible pavements treating them as two layered systems.
(b) Design the thickness of a flexible pavement by Burmister's two layer analysis, for a wheel load of 40 kN and a type pressure of 0.5 MN/m^2 . The modulus of elasticity of pavement material is 150 MN/m^2 and that of subgrade is 30 MN/m^2 . The value of F_w , displacement factor can be taken as 0.43.
- 3 (a) Explain about temperature stresses and stresses due to friction in rigid pavements.
(b) Design a CC pavement for the following conditions:
Design wheel load = 4100 kg
Present traffic = 300 commercial vehicles/day
Design life = 20 years
Traffic growth rate = 7.5 percent
Temperature variation = 13.1°C
Modulus of subgrade reaction = 6 kg/cm^3
Concrete flexural strength = 40 kg/cm^2
 $E = 3.0 \times 10^5 \text{ kg/cm}^2$
 $\mu = 0.15$
 $\alpha = 10 \times 10^{-6} \text{ per } ^\circ\text{C}$.
- 4 Explain in detail the AASHO method of flexible pavement design. What are the important factors considered in the design? Discuss.
- 5 What is the importance of joints in rigid pavements? With the help of neat diagrams, explain the various types of joints in rigid pavements.
- 6 (a) What are the required qualities of bituminous mix to act as a good highway material? Discuss.
(b) Explain clearly the procedure of penetration test conducted on bituminous materials. What is the objective of penetration test?
- 7 (a) What is soil stabilization? Explain about soil-lime stabilization and soil - cement stabilization.
(b) Explain clearly the construction procedure of cement concrete pavement.
- 8 What are the various types of failures observed in rigid pavements? What can be their possible causes and what remedial measures can be adopted? Discuss.
