

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

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- 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  $0.5 \text{ MN/m}^2$ . The modulus of elasticity of pavement material is  $150 \text{ MN/m}^2$  and that of subgrade is  $30 \text{ MN/m}^2$ . 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 =  $13.1^\circ \text{C}$   
Modulus of subgrade reaction =  $6 \text{ kg/cm}^3$   
Concrete flexural strength =  $40 \text{ kg/cm}^2$   
 $E = 3.0 \times 10^5 \text{ kg/cm}^2$   
 $\mu = 0.15$   
 $\alpha = 10 \times 10^{-6} \text{ per } ^\circ\text{C}$ .
- 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.

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