

- (b) List the various Empirical methods of Pavement Design. What are the drawbacks? 5
8. (a) Discuss the importance of repeated application of very heavy loads on rigid pavements. 10
- (b) Classify and list the factors affecting the design and performance of rigid pavements. Mention the importance of each. 10

Roll No.

23277

**M. Tech. 2nd Semester Civil
Engineering (Transportation Engg.)
Examination – June, 2023**

ANALYSIS & STRUCTURAL DESIGN OF PAVEMENTS

Paper : CE-640

Time : Three Hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions in all. All questions carry equal marks.

1. (a) What are the various functions and desirable characteristics of pavements? 10
- (b) Differentiate between rigid and flexible pavements with neat sketch. 10

2. (a) How does load transfer occurs across a contraction joint in Jointed Plain Cement Concrete Pavements ? 5
- (b) A cement concrete pavement has a thickness of 18 cm and has two lanes of 7.2 m with a longitudinal joint along the centre. Design the dimensions and spacing of the tie bar. Allowable working stress in tension = 1400 kg/cm², Unit weight of concrete = 2400 kg/m³, Allowable bond stress in deformed bars in concrete=24.6kg/cm² and coefficient of friction = 1.5. 15
3. Briefly explain flexible pavement design method using IRC 37 : 2012. 20
4. (a) Discuss the nature of load and temperature induced stresses in a concrete slab during day time and night time. Which condition is considered to be critical in pavement design ? 10

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- (b) What are the factors causing wrapping stresses in rigid pavements ? 10
5. Explain the features, characteristics and advantages of the following types of overlays over CC pavements : 20
- (a) bituminous pavement layers
- (b) unbonded CC overlay
- (c) partially bonded CC Overlay.
6. (a) Explain with neat sketch expansion and contraction joints ? What are the design considerations for both ? 10
- (b) Explain Bradbury's analysis for load transfer capacity of single dowel bar in shear, bending and bearing. 10
7. (a) Explain briefly steps for the design of CC pavements as per IRC guidelines. 15

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