

SECTION – D

8. (a) Explain net present value method and its significance. 10
(b) Explain briefly various factors affecting the vehicle operation cost. 10
9. Write short note on the following : 20
(a) Full face method
(b) Needle beam method

Roll No.

24382

**B. Tech 6th Semester (Civil)
Examination – May, 2018**

TRANSPORTATION ENGINEERING - II

Paper : CE-310-F

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 :**
- Question No. 1 is compulsory.
 - Each question carries equal mark (20 marks).
 - Students have to attempt 5 questions in total at least *one* question from each Section.
 - Use of IS 456-2000 is allowed.
 - Assume suitable data if missing.

1. Write short notes on the following : 8 × 2.5 = 20

- (i) Group index method
(ii) Warping stresses
(iii) Prestressed concrete pavements

- (iv) Surface dressing
- (v) Map(alligator) cracking
- (vi) Cross drainage
- (vii)Benefit cost ratio method
- (viii)Shield tunneling

SECTION – A

2. (a) Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the functions and importance of each component of the pavement. 10
- (b) What do you understand by frost action ? Discuss the effect and factors on which the intensity of frost action depends. Suggest measures to prevent or reduce the adverse effects. 10
3. (a) Explain the critical location of loading as regards wheel load stresses in cement concrete pavement. Discuss the Westergaard's concept and assumptions. 10
- (b) Calculate the warping stresses at interior, edge and corner for a concrete pavement of thickness 20 cm with transverse joints at 4.5 spacing. The width of slab is 3.5 m. For concrete $E = 3 \times 10^5 \text{ kg/cm}^2$ and $\mu = 0.15$, $K = 5 \text{ kg/cm}^3$ Temperature differential is 0.9 C per cm. assume thermal coefficient for concrete as 10×10^{-6} per °C. 10

SECTION – B

4. (a) What are the problems in the construction of high embankment over weak foundation soils ? How are the various problems dealt with ? 10
- (b) Write down the construction step for water bound macadam road. 10
5. Compare the following method of bituminous road construction : 20
- (a) Central plant mix and road mix method
- (b) Hot mix and cold mix

SECTION – C

6. Explain the necessity of design approach and method of strengthening of existing pavement for the following cases : 20
- (a) Flexible overlay over flexible pavement
- (b) Rigid overlay over flexible pavement
7. (a) What are the requirements of a good highway drainage system ? 10
- (b) What are the special points to be considered in the alignment of hill road ? Discuss. 10