7. Explain the necessity of design approach and method of strengthening of existing pavements for the following cases :

(i) Flexible overlay over flexible pavement

(ii) Flexible overlay over rigid pavement

(iii) Rigid overlay over rigid pavement

(iv) Rigid overlay over flexible pavement

Section–D

8. (a) Indicate how the filler materials is designed for use in sub-surface drainage system.

(b) Explain briefly various problems in hill roads construction and how they are overcome.

9. (a) Explain the method of benefit cost analysis in the case of Highways.

(b) Explain various factors affecting the vehicles operation cost.

Roll No. : .....

Total No. of Questions : **9**] [Total No. of Pages : **4**

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B.Tech. (Civil) 6th Semester (Supplementary) Examination, July–2021

(G Scheme)

HIGHWAY ENGINEERING–II

Paper–PCC-CE-306-G

*Time : **Three** Hours]* *[Maximum Marks : **75***

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 *five* questions in all, selecting *one* question from each Section. Question No. **1** is compulsory. All questions carry equal marks.

1. (a) List the various flexible pavement failures.

(b) Enlist the various types of bitumen and its quality tests.

(c) Define prime coat and tack coat.

(d) What is the elongation index ?

(e) What is the serviceability of pavements ?

(f) Briefly explain the surface and sub-surface drainage systems in pavements.

Section–A

2. (a) Explain the concept of CBR and give step by step procedure for design of flexible pavement by CBR method as per IRC recommendation.

(b) Design a flexible pavement, given R-value of subgrade soil = 32, Traffic index = 11.5, C-value of WBM base course = 20 and C-value of 7.5 cm thick bituminous surfacing = 65.

3. (a) Determine the warping stress at interior edge and corner of a 25 cm thick cement concrete pavement with transverse points at 5 m interval and longitudinal joints at 3.6 m intervals. The modules of subgrade reaction k is 6.9 kg/cm^3. Assume maximum temperature differential during day to be 0.6°C per cm slab thickness (for warping stress at interior and edge) and max temp. Differential of 0.4°C per slab thickness during night (for warping stress at the corner). Additional data given. ($e = 10 \times 10^{-6}$ per°C, $E = 3 \times 10^5$ kg/cm^2, $\mu = 0.15$, $Cx = 0.88$, $Cy = 0.54$).

(b) Briefly outline the IRC recommendation for determining the thickness of cement concrete pavement.

Section–B

4. Write short notes on the following :

(i) Seal coat

(ii) Bitumen bound macadam

(iii) Rolled asphalt

(iv) Central plant mix and road mix method

5. Explain briefly the construction procedure of BUSG and BM.

Section–C

6. (a) What are the causes of development of Potholes and how they are repaired in Bituminous roads ?

(b) Explain the procedure for patch repair works in :

(i) WBM pavement

(ii) Bituminous pavement