B.CONS.ENGG.4TH YR 1ST SEM SUPPLEMENTARY EXAM (2017)

Time : Three hours   Subject: Highway and Airport Engg   Full Marks : 100

Instructions: **PART - I**
1. Answer any **TWO** questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

1. (a) The following table gives the data obtained from the California bearing ration test of a soil sample. Find the corrected California bearing ration (percent) at 5.00mm and 2.5mm penetration? (12)

Penetration (mm)	Load on the piston (kg)
0.05	13.6
0.10	40.8
0.15	88.4
0.20	136.0
0.30	204
0.40	238
0.50	272

(b) Explain the significance of VG grade bitumen over Penetration grade bitumen?

(8)

(c) Significance of aggregate impact and crushing value. (5)

2.
 (a). Describe the factors which should be considered to make a rational approach in the Design of bituminous mixes. (5)

(b) Discuss different grades of bitumen, used in road works   with its area of application? State the significance of softening point and bitumen viscosity test.   (5)

(c) A bituminous mixture contains 60% coarse aggregate, 30%fine aggregate and 10% asphalt (By weight of the mixture). Determine the unit weight of mixture, if after compaction it contains 65% air voids. The specific gravity of the materials are: Coarse aggregate = 2.75, fine aggregate = 2.65, asphalt = 1.01.   (5)

(d) Write a short note on (i) Plate load test.   ii) Flash-Point and Fire Point Test

(10)

3. (a) Describe essential features of different types of bituminous mix.

(b) What are the essential properties of a bituminous mix?

(c) Describe cold mix asphalt with its essential characteristics.

(d) Derive the relationships of these test properties which are used to design the bituminous mixes by Marshall testing method.

(5+5+10+5)

HIGHWAY & AIRPORT ENGG   (Full marks -50)   Part-II   EX/CON/T/416/2017(S)

Assume relevant data wherever required

Answer any two questions.

1.   Write notes on the following

     (a) CT Base   (b) CT Sub base   (c) SAMI   (d) RAP   (e) DCPT   (5 X5 = 25)

2.   (a) Explain the significance of VDF and Lane distribution factor with reference to design of
     bituminous pavement.   (10)

     (b)Explain the factors which may affect rebound deflection on flexible pavement.   (5)

     © Explain the major difficulties in transforming flexible road pavements to rigid pavement of
     road networks in Kolkata.   (5)

     (d) Discuss the function of reinforcement when provided in cement concrete pavement. (5)

3.   (a) Design a two lane concrete pavement with PQC for a rural road in North 24 pgs district of
     west Bengal for a present traffic of 275 CVPD resting on subgrade with design CBR of 5% (K-
     value 42 MPa/m). (Assume relevant data).   (25)