Ref. No.: Ex/CE/5/T/401/2018

B. CIVIL ENGINEERING (EVENING) 4TH YEAR 1ST SEMESTER 2018
TRANSPORTATION ENGINEERING –II

Time: 3 Hours **Full Marks: 100**

(50 marks for each part)

Part I

Use Separate Answer scripts for each Part

Answer Any TWO questions

1. Write short note on Delay and its types. Name Two methods of Delay Study (2+6)+2

   Determine the Average Flow, Journey Speed, and Running Speed of the Streams AC & CA from the following moving car study data, and state which one shows more dense flow? 7+4+4

Section	Length (m)	Journey (sec)	Vehicles met with		
			Opposite Direction	Overtaking	Overtaken
AB	500	152	25	8	6
B	---	15	08	--	--
BC	600	172	31	5	2
C	---	5	06	--	--
CD	400	131	30	7	2
DC	400	140	35	7	6
C	---	8	05	--	--
CB	600	160	55	6	7
B	---	18	06	--	--
BA	500	145	45	7	2

2. Classify Accident. Write briefly about different methods of representation of Accident data 1+6

   Write Short Note on components of off-street parking facility 8

   The parking survey data collected from a 10-bay parking lot by license plate method is as shown below. Determine Overall Parking Load, Average Parking Index, Parking Volume, Average Turnover, and Average Duration of the parking lot. 5×2=10

Time	Bays									
	1	2	3	4	5	6	7	8	9	10
0-10	-	-	-	-	-	0899	-	-	2602	-
10-20	-	-	5135	-	5852	0899	8485	1720	-	4984
20-30	2713	-	5135	0082	5852	0899	8485	1720	5413	4984
30-40	0293	0203	5135	0082	5852	0899	8485	0530	5413	4984
40-50	6217	0203	5135	0082	-	0899	1994	0530	5413	4984
50-60	9777	0203	5135	0082	-	-	1994	0530	5413	4984

3. Write short notes on the following – 9+9+7

   a. Journey, Running & Cruising speed of a highway
   b. Automatic methods of volume study
   c. Representation of Origin and Destination Study

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B.E. CIVIL ENGINEERING (PART TIME) FORTH YEAR FIRST SEMESTER 2018

Subject: TRANSPORTATION ENGINEERING- II **Time: 3 Hours**

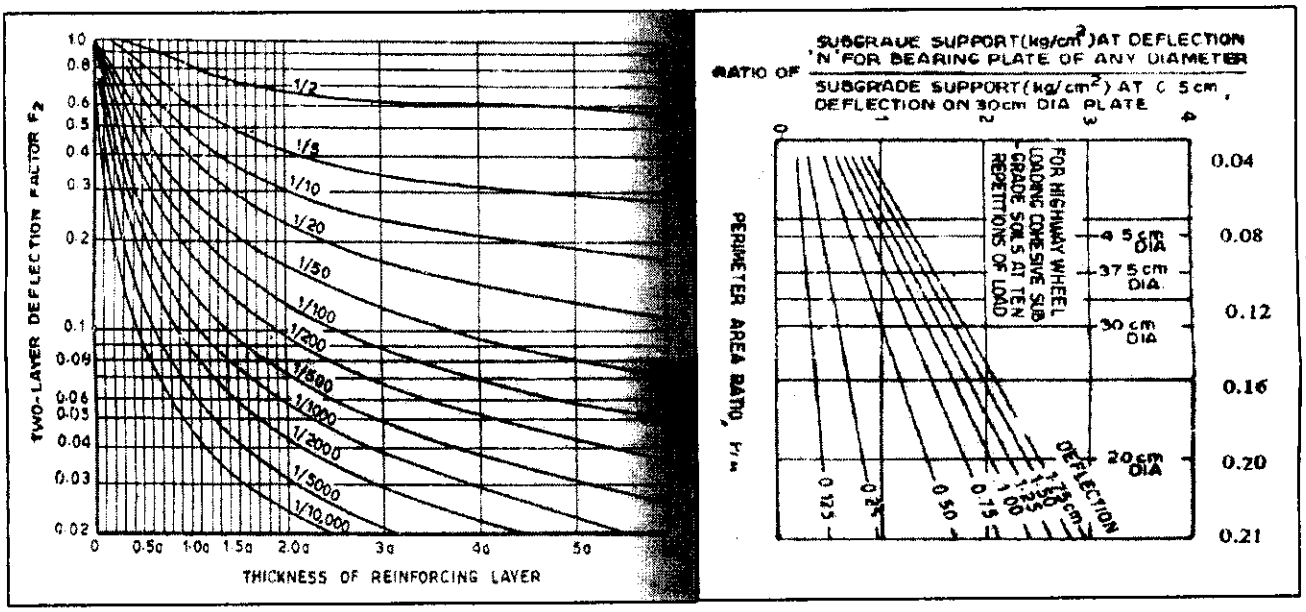
Full Marks: 50

9+9+7

Part – II

Instructions: Use Separate Answer Scripts for each Part
No code or chart is allowed.
Answer all questions.

1. (a) The plate bearing tests were conducted with 30 cm plate diameter on soil subgrade and over 20 cm base course. The pressures yielded at 0.5 cm deflection were 2.5 kg/cm^2 and 4 kg/cm^2. Design the pavement section for 4100 kg wheel load with tyre pressure of 6 kg/cm^2 for an allowable deflection of 0.5 cm using Burmister's approach. (10)



(b) Differentiate between Flexible and Rigid pavements. Enumerate the various methods of flexible pavement design. (4+2)

2. (a) Calculate ESWL of a dual wheel assembly carrying 2050 kg each for pavement thickness of 20, 25 and 30 cm. Centre to centre tyre spacing = 30 cm and distance between the walls of the tyres = 12 cm.
(b) For a 25 cm thick cement concrete pavement (Rigid pavement), analysis of stresses give the following values: (9+5)
Wheel load stress due to edge loading = 32 kg/cm^2
Warping stress at edge region during winter = 6 kg/cm^2
Warping stress at edge region during summer = 8 kg/cm^2
Frictional stress during summer = 5 kg/cm^2
Frictional stress during winter = 4 kg/cm^2
Calculate the most critical stress value for this pavement at summer and winter season.

3. (a) Discuss the difference in application of Dowel and Tie bars in Rigid pavement (with neat sketches). (5)

(b) Design Dowel and Tie bar of a Rigid Pavement for the data given below:
Slab thickness = 350mm, Expansion joint width = 25mm, Contraction Joint width = 5mm, Modulus of Subgrade Reaction = 80 MPa/m, Radius of Relative Stiffness = 1030.5 mm, E of Dowel Bar = 2×10^5MPa, Modulus of dowel support = 415000 MPa/m, Design Single axle load = 200 kN, Lane width = 6.0m, coefficient of friction = 1.5, Allowable tensile stress in deformed bars = 200MPa, Allowable bond stress for deformed bar = 2.46 MPa. (10+5)

$$F_{b\max} = \frac{k_{mds} P_i (2 + \beta Z)}{4\beta^3 EI}$$

$$F_b = \frac{(101.6 - b_d) f_{ck}}{95.25}$$, Where all the notations have their usual meaning.