

BACHELOR OF ENGINEERING (CIVIL ENGINEERING)
FOURTH YEAR FIRST SEMESTER EXAMINATION 2019 (Old)

TRANSPORTATION ENGINEERING -II

Time: 3 Hours

Full Marks: 100

Part I

(50 marks for each part)

Use Separate Answer scripts for each Part
 Answer ALL Questions

1. Write short notes on the following - 4×5=20
- Running & Cruising speed of a highway
 - External Cordon Line
 - Traffic volume growth factors
 - Off-street parking
 - Capacity following HCM 1950
2. The observations of a moving car study over a length of AD are as follows. Determine the total volume of traffic, journey time and running time over the section AD. 15

Section	AB	B	BC	C	CD	D	DC	C	CB	B	BA	
Time Taken in secs	152	15	172	10	138	20	132	12	160	18	145	
Vehicles	Opposite	25	8	31	3	28	12	50	4	55	6	45
	Overtaking	8	--	5	--	3	--	12	--	6	--	7
	Overtaken	6	--	2	--	6	--	11	--	7	--	2

3. Design a 4-phase (without any pedestrian phase) traffic signal for perpendicular intersection of two 6-lane dual carriageway roads AB and CD both having 2m wide refuge islands on them. Assume starting delay of 3 secs, and Amber period of 4secs applicable in all phases. Consider the movement from A to C as left turn, intersection characteristics as good and right turning radius, if required, as 30m using the following traffic data given in pcu/hr. 15

From	A	B	C	D
To	C	D	A	B
flow	38	785	169	91
			611	162
			37	630
			159	57
			832	153

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(1st /2nd Semester/Repeat/Supplementary /Spl. Supplementary /Old/Annual/Bi-Annual)

SUBJECT: TRANSPORTATION ENGINEERING-II

(Name in full)

PAPER ××××Time: ~~Two hours~~ / Three hours / ~~Four hours~~ / ~~Six hours~~Full Marks ~~30~~/100
(15/50 marks for each part)

Use a separate Answer-Script for each part

1 OF 3

Part -I/II/III

No. of Question		Marks
	1. Maintain neatness. Assume reasonable values of data if it is not supplied. 2. Answer any two questions 3. All drawings-must be drawn by pencil, <u>Do not retain mobile phone during examination.</u> 4. No code etc. will be needed to answer the questions of this part	
(1)(a)	Using the following data find the equal deflection ESWL for a 30 cm thick pavement by 10 +3 conventional approach: (i) tyre pressure : 5.1 kg/cm ² , (ii) two single wheels carrying load : 5400 kg/each (iii) Centre to centre distance of tyres : 30 cm (iv) Clear spacing: 10 cm (of tyres) Also work out the above problem (for 30 cm depth) by mechanistic-empirical design approach.	2
(b)	What is meant by "semi rigid pavement"?	2
(c)	Draw by pencil and subsequently label the sections of: (1) flexible pavement and (2) rigid pavement.	2×3= 6
(d)	Write short notes on any one: (i) One layer system, (ii) Two layer system	4
(2)(a)	Design a flexible pavement using the following data by any conventional method: Area of plunger = 19.6 cm ² Load at 2.5 mm penetration= 54 kg Load at 5.0 mm penetration= 80 kg CBR value of sub base = 27% CBR value for base = 90% Present traffic = 1250 vehicles per day Show the pavement section with neat sketch.	8+2=10
(b)	Either answer (I) and (II) or answer only (III) (I) What should be the design approaches regarding the strategies in a country like India? Discuss.	5
	(II) Discuss about any one - (1) Fixed traffic level approach and (2) Fixed standard vehicle approach"	4
	<u>or</u>	
	(III) Give the Possible causes of following flexible pavement distress: (1) Alligator cracking (2) Longitudinal cracking (3) Ravelling (4) Rutting (5) Bleeding	3×3=9
(c)	What are the differences and similarities between "Railway transportation" and "Roadway transportation"?	2×3=6
(3)(a)	What are the requirements of a pavement?	3

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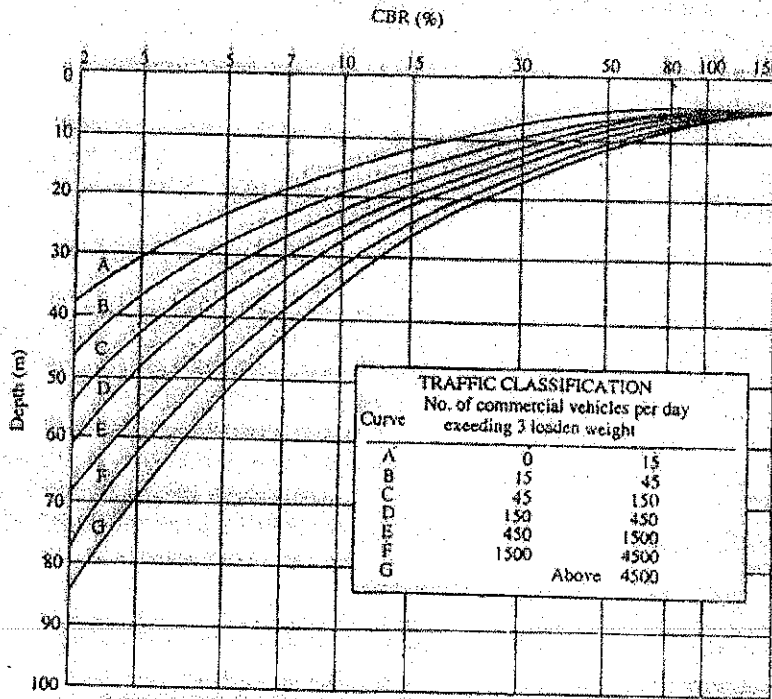
PAPER ××××

Time: ~~Two hours/ Three hours/Four hours/Six hours~~

Full Marks 30/100
(15/50 marks for each part)

Use a separate Answer-Script for each part
2 OF 3

- (b) During design of pavement, what are the factors which may affect the design? 5
- (c) Using a 25 cm diameter rigid plate, load tests conducted on soil subgrade and over a 15 cm trial base course yielded 2.4 mm deflection at 1.0 and 4.0 kg/cm² respectively. Estimate the thickness of base for a wheel load of 4050 kg with a tyre pressure of 5.7 kg/cm², if permissible deflection is 2.5 mm. 7
- (d) What are the assumptions involved for each layer in the stress distribution theories? What is meant by deflection factor? 2×3 =6
- (e) What are the differences between the flexible pavement and rigid pavement? 4



Original IRC Flexible Pavement Design Curves (IRC 37-1955)

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(45/50 marks for each part)

Use a separate Answer-Script for each part
3 OF 3

