

6E3036

Roll No. _____

Total No. of Pages : 4

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B.Tech VI Semester (Main/Back) exam. May, 2012

Civil Engg.

6CE5 Transportation Engg.-1

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Question carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/ calculated must be stated clerly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Nil

2. Nil

Unit - I

1. (a) What are the various modes of transportation? Compare each mode of transportation. 6
- (b) Explain : 3X2=6
- (i) Macadam Road
- (ii) Telford Road
- (c) Explain the importance & Role of transportaiton system? 4

Or

1. (a) Explain in brief about :
- (i) Economic studies
- (ii) Financial studies

- (iii) Traffic studies
 - (iv) Engineering studies 2x4=8
- (b) Write in brief about the development of Roads before 19th Century. 8

Unit - II

2. (a) How are roads classified in India? 8
- (b) Explain Nagpur Road development plan in detail? 8

Or

2. (a) Explain:
- (i) Rectangular or Block Pattern.
 - (ii) Radial or star or Grid Pattern.
 - (iii) Hexagonal Pattern
 - (iv) Minimum travel Pattern. 4x4=16

Unit-III

3. (a) Calculate the values of : 8
- (i) Head light sight distance
 - (ii) Intermediate sight distance for a N.H. on a plain terrain. Assume suitable data.
- (b) Design a summit curve at the intersection of two gradients +3.0% & -5.0%. Design the length of summit curve to provide S.S.D for design speed of 80 kmph. Assume suitable data. 8

Or

3. (a) Explain PIEV theory in detail. 4
- (b) Explain in brief the various cross sectional elements to be considered in designing the horizontal alignment of a road. 6
- (c) Design the rate of superelevation for a horizontal highway curve of radius 300m & design speed of 80 kmph. 6

Unit-IV

4. (a) What are the various methods of carrying out speed & delay study. Explain floating cor method in detail. 8
- (b) Explain the following : (4x2=8)
- (i) AADT
 - (ii) PCU
 - (iii) Thirtieth Highest Hourly volume.
 - (iv) Time Mean speed & space mean speed.

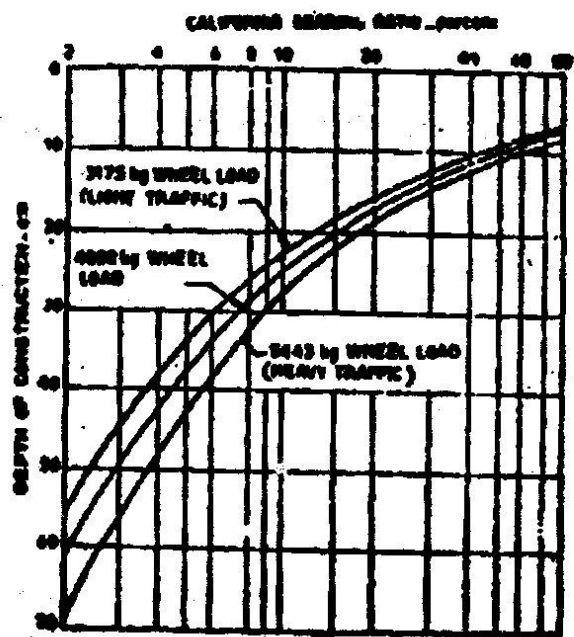
Or

4. (a) Explain the following terms: (4x2=8)
- (i) Parking Accumulation
 - (ii) Parking Volume
 - (iii) Parking Index
 - (iv) Parking turn-over
- (b) Draw and explain the collision & condition diagram. 8

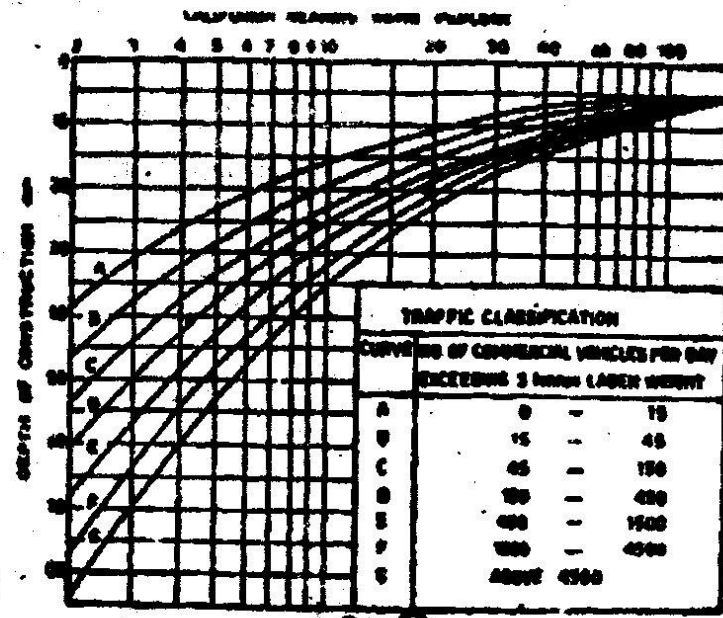
Unit-V

5. (a) The CBR value of subgrade soil is 4%, calculate total thickness of pavement using:
- (i) Design curve development by California State Highway Deptt.
 - (ii) Design chart recommended by IRC.
 - (iii) Design formula developed by us corps of Engineers. Assume 4100 kg wheel load or medium light traffic of 350 CVPD for design. Tyre pressure = 6 kg/cm²

Refer fig (1) & fig (2)



Design Chart (California State Highway Department)



C.B.R. Design Chart (Recommended by IRC)

(b) Explain GI method of design of flexible pavement. 8

Or

5. (a) Calculate the stresses at interior, edge and corner regions of a C.C. pavement using Westergaard's stress equations. Use the following data.

Wheel load (P) = 5100 kg.

Modulus of Elasticity of cement concrete, $E=3 \times 10^5 \text{ kg/cm}^2$

Pavement thickness, $h=18 \text{ cm}$

$\mu = 0.15$

Modulus of subgrade reaction, $K=6 \text{ kg/cm}^3$

Radius of contact area = 15 cm

10

(b) What are the points to be considered for road side landscaping & Arboriculture? what are the purpose of Arboriculture? 6