PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Mid Semester II Examination   Academic Year : 2009
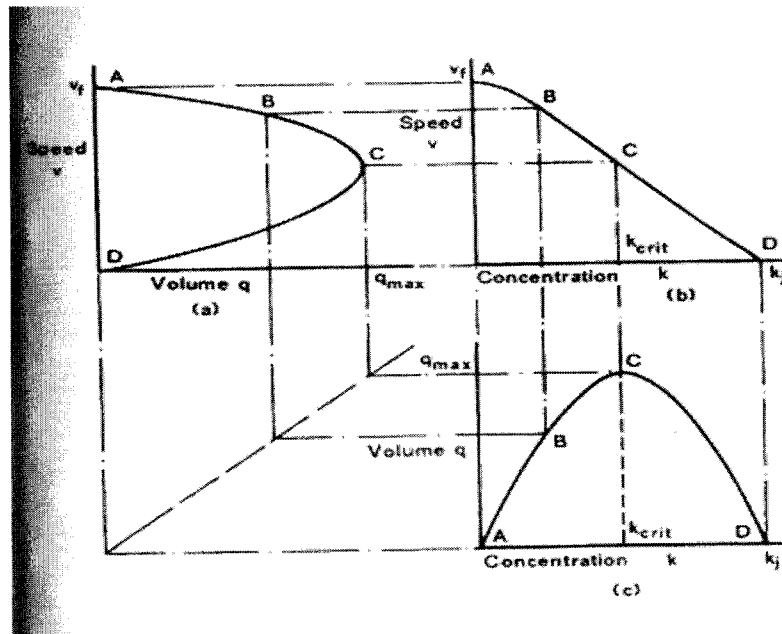Date : 24 December 2009   Time 9.00 – 12.00
Subject : 220-571 Traffic Engineering Characteristics I   Room : S 201

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1) **There are 3 questions in this paper.**
2) **This is an open book exam.**

Set by Pichai Taneerananon

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1. Describe the flow condition between A and B, B and C and C and D

2. Assuming a linear speed – density relationship, the mean free speed is observed to be 100 kph near zero density, and the corresponding jam density in 90 veh/km. Assume that the average length of vehicles is 5 metre.

    (a) Write down the speed – density and flow – density equations.
    (b) Draw the v-k, v-q, and q-k diagrams indicating critical values
    (c) Compute speed and density corresponding to a flow of 1000 veh/hr.
    (d) Compute the average headways, spacings, clearances, and gaps when the flow is maximum.

3 From the figure below

A) If traffic count of vehicles crossing the line AA' are as shown in 25 seconds , calculate the flow of vehicle per hour.

B) An observer starts a timer at 0.0 second and stops at 25.0 seconds. The times at which the front end of vehicles pass the observation line AA' are shown in the table below.

Vehicle	Time of Passing (sec)
4	3.0
5	5.3
6	8.1
7	12.2
8	15.4
9	18.2

Calculate the individual headways and the average headway.

C) A speed trap consisting of a record of times when vehicles passed two lines AA' and BB', if the time of passing BB' for vehicles are as shown below

Vehicle	Time of passing BB'
4	11.5
5	13.2
6	15.1
7	18.2
8	20.6
9	22.4

Given the trap distance equals 250 feet, calculate the average speed of each individual vehicle and the average time mean speed and space mean speed.