國立中央大學98學年度碩士班考試入學試題卷

所別：土木工程學系碩士班 運輸工程組(一般生)　科目：運輸工程　共 1 頁 第 1 頁
運輸工程組(學位在職生)　＊請在試卷答案卷（卡）內作答

九十八學年度研究所入學考式（運輸工程）

一、Define the following terms. (30%)

1. Transportation System
2. Superelevation
3. Visual Acuity
4. Mobility
5. Passing Sight Distance
6. Interchange Types

二、A driver traveling at the speed limit of 50k*m/h* (or 13.89*m/s*) was cited for crossing an intersection on red. He claimed that he was innocent because the duration of the yellow display was improper, and consequently a dilemma zone existed at that location. Using the following data, (Yellow duration=4.5*s*; Perception-reaction time=1.5*s*; Comfortable deceleration =3.5m/s^2; Car length=4.57*m*, Intersection width=15.24*m*).

(a) determine whether the driver's claim was correct. (10%)
(b) If so, what is the length of the dilemma zone? (10%)

三、Inside a tunnel the distance between the drivers and the curb is 3*m*. Assuming that the drivers fix their eyes on the curb at an angle of 2°, calculate the appropriate speed limit for a critical angular rate of change of 0.005*rad/s*. (15%)

四、A study of the traffic using a tunnel showed that the following speed-concentration (*u-k*) relationship applies:

$$u = 27.7\ln(142/k)\text{km/h}$$

Find:

(a) the capacity of the tunnel, (5%)
(b) the values of speed and concentration at capacity, and (5%)
(c) the jam concentration. (5%)

五、While taking measurements by the moving-observer method (also known as floating car method), a test vehicle covered a 2-*km* section in 1.8 *min* going against traffic and 3 *min* going with traffic. Given that the traffic flow was 800 *veh/h* and that the test vehicle passed 12 more vehicles than passed it when going with traffic,

Find:

(a) the number of vehicles encountered by the test vehicle while moving against traffic, (5%)
(b) the speed of the traffic being measured, and (10%)
(c) the concentration of the traffic stream (5%)