

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Transportation Engineering
Fundamentals

Subject Code : CCN2278

Session : Semester One, 2016/17

Numerical Answers

Question 1

(a)(i)

Peak Hour: 08:00 – 09:00

Peak Hour Volume: 1,056 pcu/hr

(a)(ii)

Adjusted Peak Hour Volume = 1,052 pcu/hr

(b)(i)

Average Speed = 62.9 km/h

SD = 9.4 km/h

85 percentile = 72.3 km/h

Question 3

(a)

Free flow speed = 85 km/hr

Jam density = 157 veh/km

(b)

Capacity = 3,345 veh/hr

(c)

$k_0 = 79$ veh/km

$v_0 = 42.5$ km/h

(d)

Speed of the shock wave = 15.0 km/h

Question 4

(a)

$VOT_{pc} = 31.4$ HK\$/hr

$VOT_{rail} = 2.6$ HK\$/hr

$VOT_{bus} = 22.5$ HK\$/hr

(b)
PC = 1,012;
Rail = 2,373;
Bus = 112

Question 5

- (a) LOS C
- (b) LOS B
- (c) 1 more lanes are required

Question 6

(a)

	<i>Model A</i>	<i>Model B</i>
AGRR	24.74%	34.70%
ANRR	4.74%	14.70%

Model B is recommended

(b)

NPVA = \$9,715 NPVB = \$67,114
Model B is recommended

(c)

B-C Ratio (A) = 1.06 B-C Ratio (B) = 1.51
Model B is recommended

(d)

Model A = 5 years Model B = 3 years
Model B is recommended