

THE HONG KONG POLYTECHNIC UNIVERSITY  
HONG KONG COMMUNITY COLLEGE

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**Subject Title** : Transportation Engineering  
Fundamentals

**Subject Code** : CCN2278

**Session** : Semester One, 2017/18

**Numerical Answers**

**Question 1**

- (a)(i) Peak Hour: 08:00 – 09:00  
Peak Hour Volume: 1,015 pcu/hr
- (a)(ii) Adjusted Peak Hour Volume = 1,084 pcu/hr
- (b)(i) Average Speed = 62.9 km/hr  
Standard Deviation = 9.8 km/hr  
Recommended speed limit = (73 to 80 km/hr)

**Question 2**

- (b)(i) East Bound Left Turn = 1786 p.c.u.  
East Bound Straight Ahead = 4210 p.c.u.  
East Bound Right Turn = 3930 p.c.u.
- (b)(ii)  $Y = 1.045$

**Question 3**

- (a)(i)  $A = 76; B = 0.66$
- (a)(ii)  $k_0 = 57.6$  veh/km  
 $v_0 = 38$  km/h
- (b)(i) LOS D
- (b)(ii) LOS D

**Question 4**

- (b)(i) Capital Cost for buying Minibuses = \$475,000-  
Driver Cost = \$676,000-  
Maintenance Cost = \$95,000-  
Fuel, Oil and Tires Cost = \$112,500-  
Management Staff Cost = \$180,000-  
Annual Operating Cost = \$1,063,500-
- (b)(ii) Salvage Value at the end of 5 Years = \$175,000-
- (b)(iii) NPV Cost = \$4,397,841-

**Question 5**

(a)

Land Use	AM Peak		PM Peak	
	Generation (Out)	Attraction (In)	Generation (Out)	Attraction (In)
R2	288	76	111	177
Village	35	24	22	35

(b)(i)  $VoT_{pc} = 35.2$  HK\$/hr  
 $VoT_{PT} = 21.4$  HK\$/hr

(b)(ii)  $PC = 870$ ;  
 $Bus = 2000$