

THE HONG KONG POLYTECHNIC UNIVERSITY  
HONG KONG COMMUNITY COLLEGE

**Subject Title** : Transportation Engineering  
Fundamentals

**Subject Code** : CCN2278

**Session** : Semester One, 2018/19

**Numerical Answers**

**Question 1**

- (a)(i) Peak Rate of Flow Period: 09:45 – 10:00  
Peak Hour Volume: 1,415 pcu/hr
- (a)(ii) Adjusted Peak Hour Volume = 1,409 pcu/hr
- (b)(i) Average Speed = 60.3 km/hr  
Standard Deviation = 9.5 km/hr  
Speed Limit = 65 to 70 km/hr

**Question 2**

- (b)(i) Critical Flow Factor  $Y = 0.442$   
Lost Time  $L = 12$  sec
- (b)(ii) Actual R.C. = 76.54%

**Question 3**

- (a)(i) Jam Density ( $k_j$ ) = 130 veh/km      Free Flow Speed ( $v_f$ ) = 65 km/h
- (a)(ii) Critical Density ( $k_0$ ) = 65 veh/km      Critical Speed ( $v_0$ ) = 32.5 km/h

**Question 4**

- (a)(i) NPV = – \$220,694- (not worthwhile)
- (a)(ii) B-C Ratio = 0.78 (not worthwhile)
- (b)(i) NPV = \$260,308- (worthwhile)
- (b)(ii) B-C Ratio = 1.26 (worthwhile)

**Question 5**

(a)

Land Use	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
R1	300	125	175	225
Commercial	108	96	105	123

- (b)  $T_{12} = 2,207$      $T_{13} = 577$      $T_{14} = 1,888$      $T_{15} = 3,128$