

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Electrical Services in Buildings **Subject Code** : CCN2267

Session : Semester One, 2018/19

Numerical Answers

Question B1

general service tariff = \$321765.6; maximum demand tariff = \$303875.7273

Question B2

(a) 783.0544 A

Question B3

- (a) 5
- (b) Overall 49 luminaires required, 7 along length and 7 along width

Question B4

- (a) 7 lifts
- (b) INT = 35.7143 s; HC = 17.6284%

Question B5

23.5412

Question C1

- (a) 80-A fuse
- (b) 70 mm² cable with 168 A; volt drop = 0.671488%; power loss = 0.6508%
- (c) I_{EF} = 511.5327 A; Disconnection time = 1.8(±0.5) s

Question C2

- (a) Total kVA = 2927.9 kVA; 2 transformers are required.

(b)

Item	Running kW	Running kVA	Starting kW	Starting kVA
1. E light & exit signs	18	20	18	20
2. Sprinkler pump set	102	120	180	360

	3. Fire services pump set	85	100	150	300
	4. Firemen lift	27.2	32	48	96
	5. Computer equipment	27	30	27	30
(c)	309.6 kW with 351.8182 kVA				
(d)	3.09460 kA				
Question C3					
(a)	Option 1: Low zone INT = 33.8546 s; high zone INT = 41.8546 s; Option 2: 19.6891 s				
(b)	Option 1: 16.8306%; Option 2: 27.4263%				
Question C4					
(a)	Vertical angles: 30.34° (below); 9.59° (above); Horizontal angles: 33.33° (for vertical angle below); 52.75° (for vertical angle below); 23.45° (for vertical angle above); 40.95° (for vertical angle above)				
(b)	0.378 (±0.02)				
(c)	1008 lux				
(d)	272.8408 lux				