

THE HONG KONG POLYTECHNIC UNIVERSITY  
HONG KONG COMMUNITY COLLEGE

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**Subject Title** : Light, Man and Environment                      **Subject Code** : CCN2023

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

**Numerical Answers**

**Question B1**

- (a)(i) < 24.96 cm or > 27.04 cm
- (b) 0.775 cd/m<sup>2</sup>
- (c)(i)  $P = 2.1287(S - 2.3855)^{0.8}$
- (c)(ii) 16.8051 g

**Question B2**

- (a) 12.8162%
- (b)(i) 51.2334%

**Question B3**

- (a) 113.9342 lm/W
- (b) 1359.9894 cd
- (c) 19239.9147 cd/m<sup>2</sup>
- (d) 339.9974 lux, 243.2823 lux

**Question B4**

- (a) 1.74 ach
- (b) 1200 ppm, 0.00435 L/s per person
- (c) 223.7143 L/s

**Question B5**

- (a) RI = 1.4118, UF = 0.47
- (c) 451.2 lux
- (d) 31.6915

**Question B6**

- (a) vertical angles: 38.66° (below), 11.53° (above), horizontal angles: 21.80° (below), 14.36° (above)
- (b) BF = 0.23 – 0.27, 41.6667 lux
- (c) E<sub>c</sub> = 90.4665 lux, E<sub>B</sub> = 19.0823 lux, E<sub>A</sub> = 20.0103 lux

**Question B7**

- (a)  $60 \text{ W/m}^2$
- (b)  $M = 68.2353 \text{ W/m}^2, L = -4 \text{ W/m}^2$
- (c)  $M - W = 65 - 13 = 52 \text{ W/m}^2, L = -8 \text{ W/m}^2$
- (d)  $\text{PMV}_A = 0.1571, \text{PMV}_B = -0.2159, \text{PMV}_C = -0.4575$

**Question B8**

- (a)  $91.0206 \text{ dB}$
- (b)  $29.7778 \text{ m}^2$
- (c)  $77.2567 \text{ dB}$
- (d)  $12.4632 \text{ m}^2$

**Question B9**

- (a)  $75.9638^\circ$
- (b)  $\delta = 0^\circ, A = 180^\circ, \alpha = 67.7^\circ$
- (c)  $6.4654 \text{ m}^2$