

THE HONG KONG POLYTECHNIC UNIVERSITY  
HONG KONG COMMUNITY COLLEGE

**Subject Title** : Architectural Technology in the Built Environment      **Subject Code** : CCN2262

**Session** : Semester One, 2016/17

**Numerical Answers**

**Question A1**

- (a) 0.3 cm
- (c) 19.5238 cm

**Question A2**

- (a) 1.0286 ach
- (b) 1750 ppm
- (c) 867 ppm

**Question A4**

- (a)(i) 0,
- (a)(ii) 78.8
- (a)(iii) +1
- (a)(iv) 81.1
- (b)(i) 8.9773 dB
- (b)(ii) 0.4001

**Question A5**

- (a) 71.7763 lm/W
- (b) 324936.4429 cd
- (c) 5066.4411 lux

**Question B1**

- (c) 1152 MJ/m<sup>2</sup>/annum
- (d) 1065742.857 kWh
- (f) 3 credits

**Question C1**

- (a) Option 1: 141.12 W; Option 2: 166.32 W; Option 3: 93.24 W; Option 4: 201.096 W
- (b) Option 1: 1283.4 W; Option 2: 2382.912 W; Option 3: 374.4 W; Option 4: 653.22 W

(c) Option 1:  $47.484 \text{ W/m}^2$ ; Option 2:  $70.812 \text{ W/m}^2$ ; Option 3:  $18.7056 \text{ W/m}^2$ ; Option 4:  $28.4772 \text{ W/m}^2$

**Question C2**

- (a)  $8.1699 \text{ m}^3/\text{s}$
- (b) 24
- (c)  $36.8627 \text{ kW}$ ; 0.765
- (d)  $27.54^\circ\text{C}$
- (e)  $35.2941 \text{ kW}$
- (f)  $5.9567^\circ\text{C}$

**Question C3**

- (a)  $1.6330 \text{ W/m}^{2^\circ\text{C}}$
- (b)  $9.7978 \text{ W/m}^2$
- (d)  $T_1 = 2.3515^\circ\text{C}$ ;  $T_2 = 3.0980^\circ\text{C}$ ;  $T_3 = 7.4526^\circ\text{C}$ ;  $T_4 = 12.1555^\circ\text{C}$ ;  $T_5 = 16.5101^\circ\text{C}$ ;  $T_6 = 20.8647^\circ\text{C}$

**Question C4**

- (b)(i) Net heat production =  $54 \text{ W/m}^2$ ; Net heat loss =  $99.5105 \text{ W/m}^2$
- (b)(ii) -2.8646

**Question C5**

- (a) 75 dB
- (b)  $10^{-3.8} \text{ W}$
- (c)  $11.2735 \text{ m}^2$
- (d) 0.0809
- (e) 1.4917 s
- (f) 77.2102 dB