

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

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

Session : Semester One, 2018/19

Numerical Answers

Question B1

- (b) 22.8571 W/m²
- (c) 1286.6724 MJ/m²/annum
- (d) Option 1: 2793650.794 kWh; Option 2: 56666.6667 kWh;
Option 3: 382666.6667 kWh
- (e) Option 1: 2.6591 yrs; Option 2: 7.5630 yrs; Option 3: 4.8532 yrs

Question C1

- (a) 0.7714 g
- (c) $P = 1.6365(S - 0.5)^{0.4961}$

Question C2

- (a) 1.8 W/m²°C
- (b) 0.1478 m²°C/W
- (c) 0.375 W/m²°C

Question C3

- (a) 63.5772 lm/W
- (b) 4047.4481 cd
- (c) 32208.5683 cd/m²
- (d) 106.7531 lux

Question C4

- (a) 16.25 W/m²
- (b) 5791.968 kWh
- (c) 5%
- (d) Reduced consumption = 5631.08 kWh

Question C5

- (a) $h_R = 46.75 \text{ kJ/kg}$; $T_R = 23.5^\circ\text{C}$
- (b) $h_M = 52 \text{ kJ/kg}$
- (c) $V_O = 0.4460 \text{ m}^3/\text{s}$; $V_R = 1.9540 \text{ m}^3/\text{s}$
- (d) 5.9639 g/s

Question C6

- (a) 17.9915 m^2
- (b) 81.1650 dB
- (c) $10^{-4.8} \text{ W}$ or $1.58489 \times 10^{-5} \text{ W}$
- (d) 0.6204 s

Question C7

- (a) $PMV = -0.375$
- (b) Male PPD = 5%; Female PPD = 19.6504%
- (c) 17.8219%