THE HONG KONG POLYTECHNIC UNIVERSITY

HONG KONG COMMUNITY COLLEGE

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**Subject Title** : Foundation Physics **Subject Code** : CCN1108

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

**Numerical Answers**

**Question B1**

(a) Time = 60 s
(b) $d_y$ = 17658 m
(c) $d_y$ = 17167.5 m
(d) Rifle recoil velocity $v_{b2}$ = -11.772 m/s

**Question B2**

(a) f = 136 Hz
(b) v = 120 $ms^{-1}$
(c)(i) $\mu$ = 0.15 kg/m
(c)(ii) v = 30 m/s

**Question B3**

(a)(i) Total Electric field = $-2.25\times10^{4}$ N/C
(a)(ii) F = $-2.25\times10^{-2}$ N
(b) E = 346 V/m
(c) $F_2$ = 20 N

**Question B4**

(a) $m_i$ = 0.241 kg
(b) W = 257.4 J
(c) $T_c$ = -270 $^oC$

**Question C1**

(a) a = 2.92 $m/s^2$; T = 16.7 N
(b)(i) $PE_0$ = 24 Nm
(b)(ii) v = 3.10 m/s
(c)(i) $T_h$ = 0.78125 N
(c)(ii) $T_v$ = 0.4905 N; T = 0.922 N

**Question C2**

(a) No. of nodes = 5; No. of antinodes = 4
(b) v = 210 m/s
(c)(i) $\lambda$ = 1.44 m; f = 236 Hz
(d)(i) Longest possible wavelength = 11 m
(d)(ii) v = 165 m/s

**Question C3**

(a)(i) $R_{light\ bulb} = 3\ \Omega$
(a)(ii) $R_3 = 2\ \Omega$
(c) $T_H = 338^oC$

**Question C4**

(b) $F/l = 1.8x10^{-6}$ N/m; total force = $3.6 \times 10^{-7}$ N