

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Basic Electricity and Electronics **Subject Code** : CCN2246

Session : Semester Two, 2017/18

Numerical Answers

Question A1

- (a) 6V
- (b) 1.429A
- (c) 0.6957V

Question A2

- (a) 58.291Ω
- (b) 0.00698W

Question A3

- (c) $V_{bn} = 10\angle-120^\circ\text{V}$, $V_{cn} = 10\angle120^\circ\text{V}$
- (d) $V_{ab} = 17.321\angle30^\circ\text{V}$, $V_{bc} = 17.321\angle-90^\circ\text{V}$, $V_{ca} = 17.321\angle150^\circ\text{V}$
- (e) $I_a = 4.4721\angle-26.565^\circ\text{A}$, $I_b = 4.4721\angle-146.565^\circ\text{A}$, $I_c = 4.4721\angle93.435^\circ\text{A}$

Question A4

- (a) $1.21 + j0.011\Omega$
- (b) $0.2348 + j0.5387\text{A}$

Question A5

- (a) 1.911V
- (b) 0.1771A

Question A6

- (b) 0.0494 V.min/r
- (c) 4880.36 rpm

Question B1

- (a) 3.632A, 0.895A, -0.105A
- (b) Power of voltage source = -36.316W, Power of current source = -0.842W
- (c) $R_T = 7.667\Omega$, $V_T = -1.333\text{V}$

Question B2

- (a) 4 nodes
- (b) 3 equations
- (c) $2\angle 0^\circ\text{V}$
- (d) Impedance of 4H inductor = $j8\Omega$, impedance of 8F capacitor = $-j10\Omega$
- (e) $1.35339 - j0.1416\text{V}$, $-0.15045 + j1.06202\text{V}$, $-0.64661 - j0.1416\text{V}$
- (f) Complex power = $0.797059 - j0.079583\text{VA}$, apparent power = 0.80102VA , average power = 0.797059 W