THE HONG KONG POLYTECHNIC UNIVERSITY

HONG KONG COMMUNITY COLLEGE

Subject Title : Logic Design **Subject Code** : CCN2272

Session : Semester One, 2018/19

Numerical Answers

Question B2

(a) A = -82, B = 53
(b) 01111001
Overflow happens.
(c)(i) 10011011
(c)(ii) 00100100
(c)(iii) 01010001

Question B3

(a) $m = 2^3$, $n = 4$

Question B4

(b) Number of words = $2^3 \times 2^{20} \times 2^3 / 2^4 = 2^{22}$ words. Hence, number of address lines = 22.
(c)(i) 32 RAM chips
(c)(ii) 18 address lines.
(c)(iii) 4-to-16-line decoder
(c)(iv) Two

Question C1

(a)(i) Number of 2-input AND gates = 256 + 16 + 16 + 4 + 4 + 4 + 4 =304
Number of inverters = 8
Gate input cost = 304 × 2 + 8 = 616
(a)(ii) In the 256 × 2 AND-OR component, gate input cost = 256 × 2 + 256 = 768
Hence, total gate input cost = 616 + 768 = 1384

Question C4

(b)(i) 1000, 0100, 0010, 0001
(b)(ii) *n* states