MATH 2590 – Exercises on Digital Hearing Aids (Answers)

PART 1 ANSWERS

1. 0.62
= 0.62x2 = 1.24 = 1
= 0.24x2 = 0.48 = 0
= 0.48x2 = 0.96 = 0
= 0.96x2 = 1.92 = 1
= 0.92x2 = 1.84 = 1
= 0.84x2 = 1.68 = 1
= 0.68x2 = 1.36 = 1
0.1001111

2. 0.58
= 0.58x2 = 1.16 = 1
= 0.16x2 = 0.32 = 0
= 0.32x2 = 0.64 = 0
= 0.64x2 = 1.28 = 1
= 0.28x2 = 0.56 = 0
= 0.56x2 = 1.12 = 1
= 0.12x2 = 0.24 = 0
0.1001010

3. 0.95
= 0.95x2 = 1.90 = 1
= 0.90x2 = 1.80 = 1
= 0.80x2 = 1.60 = 1
= 0.60x2 = 1.20 = 1
= 0.20x2 = 0.40 = 0
= 0.40x2 = 0.80 = 0
= 0.80x2 = 1.60 = 1
0.1111001

PART II ANSWERS

1. 10011000
1001100
+ 1100101
10110001

2. 11100
1010
+ 1111
11001

3. 11100
0111
+ 1110
10101

*Numbers in red indicate what has been carried.

PART III ANSWERS

1. 0.1100101
$= 1x2^{-1} + 1x2^{-2} + 0x2^{-3} + 0x2^{-4} + 1x2^{-5} + 0x2^{-6} + 1x2^{-7}$
= 0.5 + 0.25 + 0.03125 + 0.0078125
= 0.7890625

2. 0.1001111
$= 1x2^{-1} + 0x2^{-2} + 0x2^{-3} + 1x2^{-4} + 1x2^{-5} + 1x2^{-6} + 1x2^{-7}$
= 0.5 + 0.0625 + 0.03125 + 0.015625 + 0.0078125
= 0.6171875

3. 0.1111001
$= 1x2^{-1} + 1x2^{-2} + 1x2^{-3} + 1x2^{-4} + 0x2^{-5} + 0x2^{-6} + 1x2^{-7}$
= 0.5 + 0.25 + 0.125 + 0.0625 + 0.0078125
= 0.9453125