**Assignment #2 Answer Sheet Name:** Michael Buffone– September 22, 2019

**ENTER ALL YOUR FINAL ANSWERS ON THIS ANSWER SHEET FOR QUESTIONS 10 to 17 AND ATTACH YOUR SUPPORTING WORK USING EXTRA SHEETS AS A PDF**

**Question 10 – Clock Cycle time in nanoseconds**

|  |  |  |
| --- | --- | --- |
| **a)** 0.374ns | **b)** 0.319ns | **c)** 0.209ns |

**Question 11 – TRUTH TABLE**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **~B** | **~A** | A Ꚛ C | A Ꚛ C  · ~B | ~A · B | ~A · B Ꚛ C |  |  | (A Ꚛ C · ~B) + (~A · B ­­­Ꚛ C) |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |  |  | **0** |
| 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |  |  | **1** |
| 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |  |  | **1** |
| 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |  |  | **0** |
| 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |  |  | **1** |
| 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |  |  | **1** |
| 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |  |  | **0** |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |  |  | **1** |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

**Question 12 – Parity Flag Value (true if it is set, and false if it is not)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#1** True | **#2** True | **#3** False | **#4** True | **#5** False | **#6** True |

**Question 13 – Segment:Offset addresses (Hint: answers will be 5 digit HEX numbers)**

|  |  |  |
| --- | --- | --- |
| **#1** EA4A9 | **#2** 63F85 | **#3** 9A16A |

**Question 14 - Equivalent SEG:OFF addresses (The format should be AAAA:AAAA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A)** | EF9D:111E | ED78:333E | EE8C:222E | EF8B:123E |
| **B)** | 89B9:123D | 87BB:321D | 89CB:111D | 8587:555D |

**Question 15 – Convert the Base 10 REAL to IEEE-Single Precision**

|  |  |  |
| --- | --- | --- |
| **Steps:** | **First Conversion** | **Second Conversion** |
| 1. **Sign bit** | 0 | 0 |
| 1. **Integer part in binary** | 0101 0100 | 0 |
| 1. **Fraction part in binary** | 1111 0000 1010 0011 1 | 0101 0100 0111 1010 1110 00 |
| 1. **Normalized value in binary** | 01. 0101 0011 1100 0010 1000 111 x 2^6 | 1.0101 0001 1110 1011 1000 010 x 2^-2 |
| 1. **Biased exponent in binary** | 1000 0101 | 0111 1101 |
| 1. **IEEE format**   **(32 bits)** | 0 1000 0101 0101 0011 1100 0010 1000 111 | 0 0111 1101 0101 0001 1110 1011 1000 010 |

**Question 16 – Convert from IEEE-Single Precision to Base 10 REAL**

|  |  |  |
| --- | --- | --- |
| **Steps:** | **First Conversion** | **Second Conversion** |
| 1. **Sign** | 1 | 0 |
| 1. **Biased exponent** | 128 | 125 |
| 1. **Unbiased exponent** | 1 | -2 |
| 1. **Normalized value in binary** | 1.1010 1010 0000 0000 0000 000 x 2^1 | 1.1100 0000 0000 0000 0000 000 x 2^-2 |
| 1. **Unnormalized value** | 11.01 0101 0000 0000 0000 0000 | 0.0110 0000 0000 0000 0000 0000 |
| 1. **Whole number in base 10** | 3 | 0 |
| 1. **Fraction in base 10** | 21 / 64 = 0.328125 | 3 / 8 = 0.375 |
| 1. **Real number in base 10 (don’t forget the sign)** | -3.328125 | 0.375 |

**Question 17 – Convert the Base 10 REAL to IEEE-Double Precision**

|  |  |
| --- | --- |
| **Steps:** |  |
| 1. **Sign bit** | 1 |
| 1. **Integer part in binary** | 1 0001 0100 |
| 1. **Fraction part in binary** | 1010 0001 0100 0111 1010 11 |
| 1. **Normalized value in binary** | 1.0001 0100 1010 0001 0100 0111 1010 1110 0001 0100 0111 1010 1110 x 2^8 |
| 1. **Biased exponent in binary** | 100 0000 0111 |
| 1. **IEEE format** 2. **(64 bits)** | 1 100 0000 0111 0001 0100 1010 0001 0100 0111 1010 1110 0001 0100 0111 1010 1110 |

**ALL OF YOUR FINAL ANSWERS FOR QUESTIONS 10-17 MUST BE ON THIS FORM.**

**ATTACH YOUR SUPPORTING WORK FOR Q10-17 as a PDF – NO SUPPORT WILL RESULT IN A 50% PENALTY.**

**Support may be hand written and then scanned to a PDF document or typed.**