جامعة الملك فهد للبترول والمعادن
King Fahd University of Petroleum & Minerals

Quiz 5 (Fall 2022) - Solution

Course Name: Computer Organization **Time: 15 mins**

Instructor: Dr. Ayaz ul Hassan Khan

Name: _____ Identification #: _____
Date: _____ Total Marks: 10 Marks Obtained: _____
Signature of Instructor: _____

Consider the following single-precision floating-point number representations:
X = 1 10100000 01010101011011001001110
Y = 0 01100000 01010001000001000000000

Solve X * Y for normalized floating point result (Rounded to Nearest Even) [10]

E_X = 10100000 = 160
E_Y = 01100000 = 96
$E_Z = E_X + E_Y - 127 = 160 + 96 - 127 = 129$
$exponent\_value_Z = E_Z - 127 = 129 - 127 = 2$
$Sign_z = 1$

```
                                                1. 01010101011011001001110
                                              x 1. 01010001000001000000000
                                                ---------------------------------
                                                  01010101011011001001110
                                                 01010101011011001001110
                                                01010101011011001001110
                                               01010101011011001001110
                                             1.01010101011011001001110
                                               ---------------------------------------------------------
                                             1.11000001011110010100111100001110011100000000000
```

$-1.11000001011110010100111 \times 2^2$
Rounded:
$-1.11000001011110010101000 \times 2^2$

Ans = 1 10000001 11000001011110010101000