Title: **Engineering and Scientific Notation** Worksheet: 1

Course: Electrical Applications Unit: Electrical Theory CLO: 3

Name ANSWER KEY Grade 70pts. Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall convert a decimal number to its engineering notation equivalent.
2. Student shall convert a decimal number to its scientific notation equivalent.
3. Student shall contrast the difference between representing number through decimal, engineering and scientific notation.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Worksheet. Grading shall be based on an answer key.

**Conventions**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Symbol | Decimal Value | Power of Ten |
| giga | G | 1,000,000,000 | 109 |
| mega | M | 1,000,000 | 106 |
| kilo | k | 1,000 | 103 |
| milli | m | 0.001 | 10-3 |
| micro | μ | 0.000001 | 10-6 |
| nano | n | 0.000000001 | 10-9 |
| pico | p | 0.000000000001 | 10-12 |

Rules for Engineering Notation

1. Numbers between 1 and 999 have no symbol associated with them.
2. Engineering numbers must contain at least one whole number but no more than three whole numbers.
3. Engineering numbers are rounded off at the third decimal places after the number is converted to engineering notation.

Examples of Engineering Notation:

139564.836 139.565k

2899271 2.899M

0.00281763 2.818m

0.000026754 26.754μ

837.16352 837.164

Rules for Scientific Notation

1. A scientific number shall have one digit to the left of the decimal and the remaining digits to the right of the decimal.
2. The magnitude of the number is expressed by a multiple of 10 (i.e. x102, x100, x10-3).
3. Scientific numbers may or may not be rounded off to a particular place. In this class we shall round off to three decimal places to the right of the decimal point.

Examples of Scientific Notation:

139564.836 1.396 x 105

2899271 2.899 x 106

0.00281763 2.818 x 10-3

0.000026754 2.675 x 10-5

837.16352 8.372 x 102

**Instructions**

Convert the following numbers to their equivalent forms.

Decimal Scientific Engineering

1. 1259943 1.260x106 1.260M
2. 0.0000253 2.53x10-5 25.3μ
3. 0.000003537 3.537x10-6 3.537μ
4. 0.00000032394 3.239x10-7 323.94n
5. 652433489 6.524x108 652.433M
6. 0.04196 4.196 x 10-2 41.96m
7. 0.00000008974 8.974 x 10-8 89.74n
8. 284100 2.841 x 105 284.1k
9. 83460000 8.346 x 107 83.46M
10. 0.00000000007427 7.424 x 10-11 74.24p
11. 873832 8.738 x 105 873.832k
12. 0.009822 9.822 x 10-3 9.822m
13. 38264000000 3.826 x 1010 38.264G
14. 0.000737263 7.373x10-4 737.263μ
15. 0.0000002985 2.985 x 10-7 298.5n

Convert the Decimal Number to Engineering Notation and vise-versa

1. 0.0023 2.3m
2. 0.00045 450μ
3. 0.0355 35.5m
4. 0.00000455 4.55μ
5. 0.8324 832.4m
6. 154000 154k
7. 7834000 7.834M
8. 1200 1.2k
9. 674000000 674M
10. 35000 35k
11. 0.000000000124 124p
12. 0.000457 457μ
13. 0.035 35m
14. 0.00000000167 1.67n
15. 103000 103k
16. 1270000 1.27M
17. 4500000000 4.5G
18. 3592 3.592k
19. 0.00004537 45.37μ
20. 0.00000000001522 15.22p

Convert the following decimal numbers to engineering notation form.

1. 0.0321 32.1m
2. 649488 649.488k
3. 0.0196 19.6m
4. 158731 158.731k

Convert the following scientific notation numbers to their decimal form.

1. 8.726 x 104 87260
2. 7.9821 x 10-5 0.000079821
3. 7.326 x 105 732600
4. 1.3721 x 10-4 0.00013721

Convert the following decimal numbers to their scientific notation form.

1. 670811 6.708 x 105
2. 0.0629 6.29 x 10-2
3. 116780 1.168 x 105
4. 0.00124 1.24 x 10-3

Convert the following engineering notation numbers to their decimal form.

1. 351.2k 351200
2. 4.85μ 0.00000485
3. 23.25k 23250
4. 125k 125000

Convert the following scientific notation numbers to their engineering notation form.

1. 3.896 x 104 38.96k
2. 1.246 x 10-5 12.46μ
3. 1.836 x 104 18.36k
4. 7.326 x 10-3 7.326m

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