# COLLEGE OF ENGINEERING AND MINES
## DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

| COURSE CODE | EE F102 F01 (CRN: 34544) |
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| COURSE NAME | INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING |
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| SEMESTER | SPRING |
|---|---|

| YEAR | 2022 |
|---|---|

| TYPE AND NUMBER OF SUBMISSION | HOMEWORK 1 |
|---|---|

| METHOD OF SUBMISSION | ONLINE TO : maher.albadri@alaska.edu |
|---|---|

| DATE OF ASSIGNMENT | THURSDAY 13 JAN 2022 |
|---|---|

| DUE DATE OF SUBMISSION | FRIDAY 21 JAN 2022 | DUE TIME OF SUBMISSION | 23:59 |
|---|---|---|---|

| STUDENT NAME | |
|---|---|

MAKE THIS FORM A "COVER PAGE" FOR YOUR HOMEWORK SUBMISSION.

| FOR THE TA USE ONLY |
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| REMARKS: |

| FOR THE TA USE ONLY | | |
|---|---|---|
| PROBLEM NUMBER | MAXIMUM POINTS POSSIBLE | POINTS EARNED |
| PROBLEM 1 | 75 | |
| PROBLEM 2 | 75 | |
| | | |
| TOTAL | 150 | |

Problem HW-1-1
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<div style="text-align: right">Points
Distribution
**************</div>

(a)   500 N force is used to move an object over a distance of 1000 cm.        (15)
      Calculate the energy, in kJ, required to do this work.


(b)   5 kJ of energy is utilized to move an object and distance of 10 m.       (15)
      Calculate the applied force, in newtons (N).


(c)   How many significant digits are in the following numbers:               (15)

        i.    69.00056 m
       ii.    0.01225600 ft
      iii.    123.800000 in
       iv.    $1.0 \times 10^2$ J


(d)   Three methods were used to measure a 5 Ω resistor.                       (15)
      Each measurement was repeated 4 times and tabulated in the following
      table.
      Determine the method with highest accuracy. You can use spreadsheet
      tool to perform quick calculations.

| Method I (Ω) | Method II (Ω) | Method III (Ω) |
|---|---|---|
| 5.0041 | 5.0022 | 5.1012 |
| 5.0151 | 5.0011 | 5.1112 |
| 5.0991 | 5.0101 | 5.1023 |
| 5.0261 | 5.0041 | 5.1022 |


(e)   In the previous problem, determine which method has the highest          (15)
      precision.


                            *** *** ***

Problem HW-1-2
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(a)   Determine the result to the correct number of significant digits         (25)
      for the following computations:

      i.     $0.0012584 \times 50.1 = ?$
      ii.    $\left(5.0 \times 10^5\right) \div 40.1 = ?$
      iii.   $55.685 + 3.2 - 7.01 = ?$

(b)   Fill out the right column with the correct value that match the unit     (25)
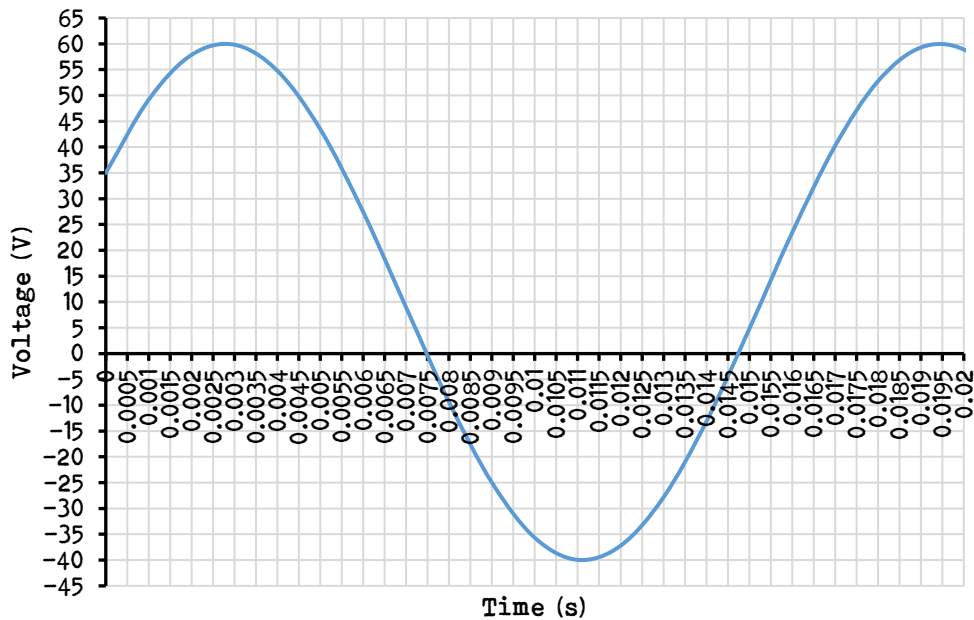      shown in the column title

| feet | in |
|------|----|
| 5    |    |

| kilometer | mile |
|-----------|------|
| 5         |      |

| Ω    | mΩ |
|------|----|
| 0.35 |    |

| Volt | kilovolt |
|------|----------|
| 120  |          |

(c)   Determine the value of the DC offset "A", in volts, the amplitude "B",   (25)
      in volts, the period "T", in seconds, and the phase angle "φ", in
      radians, of the voltage signal seen in the following figure.



$$v(t)=A + B\sin(\omega t+\phi)$$

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