ASSIGNMENT - I
Course: MCSC 202

Problem 1 Round off the following numbers to four decimal places:
(a) 0.235082  (b) 0.0022218  (c) 4.50089  (d) 2.36425  (e) 1.3456

Problem 2 Find the sum of the numbers 1.3526, 2.00462, 1.532, 28.201, 31.0012 when each of them are correct to their last digit.

Problem 3 Find the difference $\sqrt{2.01} - \sqrt{2}$ to three correct digits.

Problem 4 Find the relative error in computation of $x - y$ for $x = 12.05$ and $y = 8.02$ having absolute errors $\Delta x = 0.005$ and $\Delta y = 0.001$.

Problem 5 If $y = 4x^6 - 5x$, find the percentage error in $y$ at $x = 1$ if the error in $x$ is 0.04.

Problem 6 Round off the number 865230 to four significant figures and compute the absolute, relative and percentage errors occur.

Problem 7 Round off the number 47.5689 to four significant figures and then compute the absolute, relative, and percentage errors occur.

Problem 8 The computing value of a problem as 68.91. The relative error in the computing values is at most 2%. Find to four decimal places the range within which the exact value must lie.

Problem 9 If $u = 4x^2y^3/z^4$ and errors in $x, y, z$ be 0.001. Compute the maximum relative error in $u$ when $x = y = z = 1$.

Problem 10 Compute the following with regard to significant figures:

(a) $876 \div 0.4382$
(b) $8.0 - 0.42$
(c) $4.6 \times 0.128$
(d) $56.54 \times 12.4$
(e) $\frac{0.995 \times 1.53}{1.592}$
(f) $\frac{1.265(10.215 - 2.541)}{47.3}$

Problem 11 Let $f(x) = \frac{x \cos x - \sin x}{x - \sin x}$
(a) Use four-digit rounding arithmetic to evaluate $f(0.1)$.
(b) Replace each trigonometric function with its third Maclaurin polynomial, and repeat part (a).
(c) The actual value of $f(0.1) = -1.99899998$. Find the relative error for the values obtained in parts (a) and (b).

Problem 12 Given that $a = 10.00 \pm 0.05; b = 0.0356 \pm 0.0002; c = 15300 \pm 100; d = 62000 \pm 500$. Find the value of the absolute error in (i) $a + b + c + d$  (ii) $a + 5c - d$  (iii) $c^3$.