ELECTRICAL MATHEMATICS
TEST 2 – *TRIAL TEST/ASSIGNMENT*

Notes:

- This test covers substitutions, basic algebra, and evaluation of subject/transposition of formulae.
- The actual test will be closed book, calculator permitted.
- It is **ESSENTIAL** to show working/steps, where asked, otherwise **no marks** can be given.

1. Evaluate the following expressions:

   a. $a = bc$ where $b = 3.08$ and $c = 39.5$

   b. $X = \frac{Y}{Z}$ where $Y = 0.00043$ and $Z = 77.9$

   c. $R_T = R_1 + R_2 + R_3$ where $R_1 = 820$, $R_2 = 220$ and $R_3 = 470$

   d. $m = (u + v)^2 s$ where $u = 40.4$, $v = 37.0$ and $s = 1.23 \times 10^{-3}$

   e. $R = (6.0 - ST)^3$ where $S = 5.7 \times 10^{-4}$ and $T = 2.87 \times 10^{3}$

2. Transpose each of the following formulae, making the variable in brackets the subject of the equation.

   a. $V = IR$ (R)

   b. $I = \frac{Q}{t}$ (t)

   c. $R_T = R_1 + R_2 + R_3$ (R_2)

   d. $P = I^2 R$ (I)

e. $\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2}$ (R_1)

3. Express the following in their simplest form:

a. $4m^2 - 7mn + 3m^2 - 2mn + 5$

b. $(a - b) - (a + b)$

c. $(a - b)(a + b)$

d. $(3x - 4y)(3x - 4y) + 24xy$

e. $24xyz \div 12y$

4. Solve the following equations for the unknown:

a. $5 - \frac{x-3}{2} = 0$

b. $\frac{3}{m} + \frac{2}{m} = \frac{15}{6}$

c. $\frac{4}{5y + 2} = \frac{7}{7y - 3}$

5. Given $I = \dfrac{I_1(R_1 + R_2)}{R_2}$

a. Evaluate I when I_1 = 240mA, R_1 = 680Ω and R_2 = 2.2kΩ

b. Transpose to find R_2

c. Evaluate R_2 when I = 1.07 A, I_1 = 970mA and R_1 = 82kΩ

6. Solve for x in each of the following:

a. $2v = 3u + ax$

b. $\frac{k}{x^2} = 5w + 2$

c. $y = n - \sqrt{\frac{x-a}{3}}$

------- END OF TRIAL TEST/ASSIGNMENT - *Check your work!* -------