**September 14, 2016**

**PROBLEM SET 1 – B**

**ENG 1440** **Introduction to Statics** **Dr. J. Frye**

**Question 1:** Solve the equations:

(i) $3x - 8y = 14$
$5x + 4y = 6$

(ii) $-20\cos 45^o - F_2 \cos 30^o - F_1 \cos 60^0 = 0$
$20\cos 45^o + 18 - F_2 \sin 30^o - F_1 \sin 60^o = 0$

(iii) $2x + 2y - 3z = 16$
$4x - 3y - 5z = 9$
$6x + 5y + 4z = 19$

(iv) $\frac{2}{7}x - \frac{3}{5}y = 0$
$\frac{6}{7}x + \frac{4}{5}y + \frac{3}{5}z = 7090$
$-\frac{3}{7}x + \frac{4}{7}z = 0$

(v) $0.5T_{DA}\sin\phi = 0$
$0.866T_{DA} - W = 0$
$0.5T_{DA}\cos\phi = 50$

(vi) $100\sin\alpha - 400\cos(30^0 - \alpha) = 210$

**Question 2:** Find the determinant value of:

(i) $\begin{vmatrix} 7 & 2 \\ 2 & -1 \end{vmatrix}$

(ii) $\begin{vmatrix} 3 & 1 & -4 \\ 0 & -3 & 5 \\ 2 & -1 & 7 \end{vmatrix}$

(iii) $\begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 3 & -2 & 4 \\ 4 & 3 & -5 \end{vmatrix}$

(iv) $\begin{vmatrix} 9.6 & -2.4 & 3.2 \\ 2.4 & -1.2 & 1.6 \\ 600 & 1200 & -400 \end{vmatrix}$