**JIS College of Engineering**

**B. Tech (Information Technology)-5th Semester**

Computer Graphics Assignment

Paper Code: **IT-505C**  Assignment ID: **Soham/OSem/2015/IT505C/0006**

*Computer Graphics is no separate from Mathematics!*

I am: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Roll: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

My Full Signature:

1. Express transformation matrices for reflection of a point about any straight line **y=mx+c**

$Check and Tally:\left[\begin{matrix}cos 2θ&sin2θ&-c sin2θ\\sin2θ&-cos 2θ&c(1+cos 2θ)\\0&0&1\end{matrix}\right]$ **whereθ=tan-1 (m)**

1. A mirror is placed on X-Y plane such that it passes through the points (**2,0**) and (**0,2**). What will be the vertices of ΔABC after reflection?

ΔABC ≡ $\left(\begin{matrix}5&5\\3&4\\4&7\end{matrix}\right)$

*[Check and Tally: Answer should be (-2, -1), (-3, -3), (-5, -2)]*

1. Following transformations are applied to ΔABC in sequence:
	1. Reflection about the **X-axis**

ΔABC ≡ $\left(\begin{matrix}8&2\\10&4\\8&6\end{matrix}\right)$

* 1. Reflection about the straight line **y=-x**
	2. Rotation about the origin by **270°**

Find an equivalent single Transformation matrix combining the above 3 transformations. Finally, what do you conclude?

*[Check and Tally: “I will not tell you beforehand!”]*

**ABCD** ≡ $\left(\begin{matrix}2&2\\10&6\\8&10\\0&6\end{matrix}\right)$

1. Perform viewport transformation of the rectangle ABCD to a viewport whose lower left is at the point A and is the entire *normalized* screen.

*[Check and Tally:* *]*