In the given questions 1-3 of lecture-14, we are to find the formulas for X, Y and Z in terms of A, B and C provided that the given matrix equations are satisfied.

$\because$ here given that $\begin{pmatrix} A & B \\ C & O \end{pmatrix}\begin{pmatrix} I & O \\ X & Y \end{pmatrix} = \begin{pmatrix} O & I \\ Z & O \end{pmatrix}$

$\implies \begin{pmatrix} AI+BX & AO+BY \\ CI+OX & CO+OY \end{pmatrix} = \begin{pmatrix} O & I \\ Z & O \end{pmatrix}$

$\implies \begin{pmatrix} A+BX & BY \\ C & O \end{pmatrix} = \begin{pmatrix} O & I \\ Z & O \end{pmatrix}$

Equating the corresponding entries on both sides;

$\implies A + BX = O,$

$BY = I,$

$\boxed{C = Z}$

and

$O = O$

Here $BY = I$

$\implies B$ is invertible

$\therefore BB^{-1}Y = B^{-1}I$

$\implies IY = B^{-1}I$

$\implies \boxed{Y = B^{-1}}$

Now from $A + BX = O$

$\implies BX = -A$

$\implies B^{-1}BX = B^{-1}(-A)$

$\implies IX = -B^{-1}A$

$\implies \boxed{X = -B^{-1}A}$