Solution 35:

$\dot{\vec{\phi}} = \dot{\phi}\,\hat{Z}\,.$

$\dot{\vec{\theta}}$ is along the node axis ON. Therefore, $\dot{\vec{\theta}} = \dot{\theta}\,\cos\phi\,\hat{X} + \dot{\theta}\,\sin\phi\,\hat{Y}\,.$

$\dot{\vec{\psi}} = \dot{\psi}\,\hat{x}_3$ and $\hat{x}_3 = \cos\theta\,\hat{Z} + \sin\theta\,\hat{\rho}$, where $\hat{\rho}$ is in the $X-Y$ plane, $\hat{\rho} = \sin\phi\,\hat{X} - \cos\phi\,\hat{Y}$. Therefore, $\dot{\vec{\psi}} = \dot{\psi}\,\cos\theta\,\hat{Z} + \dot{\psi}\,\sin\phi\,\hat{X} - \dot{\psi}\,\cos\phi\,\hat{Y}\,.$

Collecting all terms ($\Omega_X = \hat{X}\cdot\vec{\Omega}$ and so on):

$$\begin{aligned}
\Omega_X &= \dot{\theta}\,\cos\phi + \dot{\psi}\,\sin\phi\,,\\
\Omega_Y &= \dot{\theta}\,\sin\phi - \dot{\psi}\,\cos\phi\,,\\
\Omega_Z &= \dot{\phi} + \dot{\psi}\,\cos\theta\,.
\end{aligned}$$