Вариант 1.

1) $k = \frac{2\,e^{3t}}{\left(1+e^{4t}\right)^{3/2}}$

2) $k3 = \frac{\sqrt{2}\,e^{2t}}{\left(1+e^{2t}\right)^{2}},\ \varkappa 3 = -\frac{\sqrt{2}\,e^{2t}}{\left(1+e^{2t}\right)^{2}}$

$(\tau,\nu,\beta) =$

$$\left\{\left\{\frac{e^{2t}}{1+e^{2t}}, -\frac{1}{1+e^{2t}}, \frac{\sqrt{2}\,e^{t}}{1+e^{2t}}\right\}, \left\{\frac{\sqrt{2}\,e^{t}}{1+e^{2t}}, \frac{\sqrt{2}\,e^{t}}{1+e^{2t}}, \frac{1-e^{2t}}{1+e^{2t}}\right\}, \left\{-\frac{1}{1+e^{2t}}, \frac{e^{2t}}{1+e^{2t}}, \frac{\sqrt{2}\,e^{t}}{1+e^{2t}}\right\}\right\}$$

3) $G = \begin{pmatrix} 1 & 0 \\ 0 & a^2+u^2 \end{pmatrix},\ Q = \begin{pmatrix} 0 & -\frac{a}{\sqrt{a^2+u^2}} \\ -\frac{a}{\sqrt{a^2+u^2}} & 0 \end{pmatrix}$

$\{\lambda_1,\lambda_2\} = \left\{-\frac{a}{a^2+u^2}, \frac{a}{a^2+u^2}\right\}$

$\{e_1,e_2\} = \left\{\left\{\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2\,a^2+2\,u^2}}\right\}, \left\{-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2\,a^2+2\,u^2}}\right\}\right\}$

4) $\cos\varphi = \frac{a^2}{2+a^2}$

Вариант 2.

1) $k = \frac{e^{-t}}{\sqrt{2}}$

2) $k3 = \frac{1}{3}\sqrt{2}\,e^{-t},\ \varkappa 3 = -\frac{e^{-t}}{3}$

$$(\tau,\nu,\beta) = \left\{\left\{\frac{\cos(t)+\sin(t)}{\sqrt{3}}, \frac{\cos(t)-\sin(t)}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right\},\right.$$

$$\left.\left\{\frac{\cos(t)-\sin(t)}{\sqrt{2}}, -\frac{\cos(t)+\sin(t)}{\sqrt{2}}, 0\right\}, \left\{\frac{\cos(t)+\sin(t)}{\sqrt{6}}, \frac{\cos(t)-\sin(t)}{\sqrt{6}}, -\sqrt{\frac{2}{3}}\right\}\right\}$$

3) $G = \begin{pmatrix} 2 & 2 \\ 2 & 2+u^2 \end{pmatrix},\ Q = \begin{pmatrix} 0 & 0 \\ 0 & \frac{u}{\sqrt{2}} \end{pmatrix}$

$\{\lambda_1,\lambda_2\} = \left\{\frac{1}{\sqrt{2}\,u}, 0\right\}$

$\{e_1,e_2\} = \left\{\left\{-\frac{1}{u}, \frac{1}{u}\right\}, \left\{\frac{1}{\sqrt{2}}, 0\right\}\right\}$

4) $\cos\varphi = \frac{1}{3}$

Вариант 3.

1) $k = \frac{2\,t^3}{\left(1+t^4\right)^{3/2}}$

2) $k3 = \frac{\sqrt{2}\,t^2}{\left(1+t^2\right)^{2}},\ \varkappa 3 = -\frac{\sqrt{2}\,t^2}{\left(1+t^2\right)^{2}}$

$$(\tau,\nu,\beta) = \left\{\left\{\frac{t^2}{1+t^2}, -\frac{1}{1+t^2}, \frac{\sqrt{2}\,t}{1+t^2}\right\}, \left\{\frac{\sqrt{2}\,t}{1+t^2}, \frac{\sqrt{2}\,t}{1+t^2}, \frac{1-t^2}{1+t^2}\right\}, \left\{-\frac{1}{1+t^2}, \frac{t^2}{1+t^2}, \frac{\sqrt{2}\,t}{1+t^2}\right\}\right\}$$

3) $G = \begin{pmatrix} e^{2u} & 0 \\ 0 & a^2+e^{2u} \end{pmatrix},\ Q = \begin{pmatrix} 0 & -\frac{a\,e^{u}}{\sqrt{a^2+e^{2u}}} \\ -\frac{a\,e^{u}}{\sqrt{a^2+e^{2u}}} & 0 \end{pmatrix}$

$\{\lambda_1,\lambda_2\} = \left\{-\frac{a}{a^2+e^{2u}}, \frac{a}{a^2+e^{2u}}\right\}$

$\{e_1,e_2\} = \left\{\left\{\frac{e^{-u}}{\sqrt{2}}, \frac{1}{\sqrt{2\,a^2+2\,e^{2u}}}\right\}, \left\{-\frac{e^{-u}}{\sqrt{2}}, \frac{1}{\sqrt{2\,a^2+2\,e^{2u}}}\right\}\right\}$

4) $\cos\varphi = \frac{a^2}{a^2+2\,e^2}$