Probeklausur

1a) $\lambda_1 = 0$, $\lambda_2 = -4$, $\lambda_3 = 12$

b) $\vec{v}_1 = \begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}$, $\vec{v}_2 = \begin{pmatrix} -1 \\ 0 \\ 1 \end{pmatrix}$, $\vec{v}_3 = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$

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c) $B = \begin{pmatrix} 1/\sqrt{6} & -1/\sqrt{2} & 1/\sqrt{3} \\ -2/\sqrt{6} & 0 & 1/\sqrt{3} \\ 1/\sqrt{6} & 1/\sqrt{2} & 1/\sqrt{3} \end{pmatrix}$

2) a) Max $(+\sqrt{2} \mid (2\sqrt{2}+2) \cdot e^{-\sqrt{2}})$

Min $(-\sqrt{2} \mid (-2\sqrt{2}+2) \cdot e^{\sqrt{2}})$

W $(1-\sqrt{3} \mid (6-4\sqrt{3}) e^{\sqrt{3}-1})$

b) $t(x) = 2x$

c) $x_{01} = 0$, $m_1 = 2$

$x_{02} = -2$, $m_2 = -2e^2$

3) a) $A = 1$

b) $g(t) = \lim_{x \to \infty} -\frac{-1 + e^{-xt} + e^{-xt} \cdot xt}{t^2}$

$= \frac{1}{t^2}$, $t > 0$

4) a) $T_4(x) = 6 - x^4$

b) $\int_0^2 T_4(x) = \frac{28}{5}$

5 a) $z_1 = 4 \cdot e^{j90°}$, $z_2 = 4 \cdot e^{j60°} \Rightarrow z_3 = 4 \cdot e^{j30°} = 2\sqrt{3} + 2j$

$z_4 = 256 \cdot e^{j120°} = -128 + 128 \cdot \sqrt{3}\, j$

$\Rightarrow$ $\sqrt{3}$ $j60°$ $\sqrt{2}$ $j60°$ $\sqrt{3}$ $j28$