EECE 290, Problem solving

Session 5

Inverse Laplace Transform

$\mathcal{L}^{-1}\{e^{-2s}/s\} = ?$
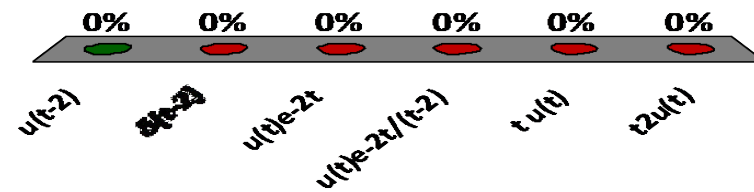
$\mathcal{L}\{\delta(t)\} = 1$

$\mathcal{L}\{u(t)\} = \frac{1}{s}$

$\mathcal{L}\{e^{-at}u(t)\} = \frac{1}{s+a}$

$\mathcal{L}\{f(t-a)\} = e^{-as}F\{s\}$

A. u(t-2)

B. δ(t-2)

C. u(t)e^{-2t}

D. u(t)e^{-2t}/(t-2)

E. t u(t)

F. t^{2}u(t)

0%   0%   0%   0%   0%   0%

u(t-2)   δ(t-2)   u(t)e-2t   u(t)e-2t/(t-2)   t u(t)   t2u(t)

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$$\mathcal{L}\{\delta(t)\} = 1$$
$$\mathcal{L}\{u(t)\} = \frac{1}{s}$$
$$\mathcal{L}\{e^{-at}u(t)\} = \frac{1}{s+a}$$
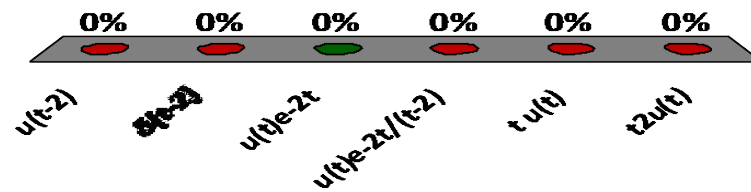$$\mathcal{L}\{f(t-a)\} = e^{-as}F\{s\}$$

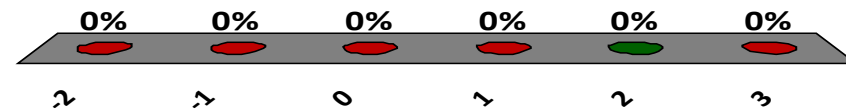$\mathcal{L}^{-1}\{1/(s+2)\}=?$

A. u(t-2)

B. δ(t-2)

C. u(t)e^{-2t}

D. u(t)e^{-2t}/(t-2)

E. t u(t)

F. t²u(t)

0% 0% 0% 0% 0% 0%
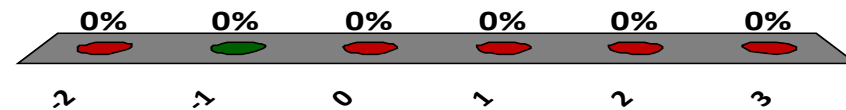
u(t-2) δ(t-2) u(t)e-2t u(t)e-2t/(t-2) t u(t) t2u(t)

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$$\frac{s+3}{(s^2+3s+2)} = \frac{s+3}{(s+1)(s+2)} = \frac{K_1}{(s+1)} + \frac{K_2}{(s+2)}; \ K_1 = ?$$

A. -2

B. -1

C. 0

D. 1

E. 2

F. 3

0%   0%   0%   0%   0%   0%

30

$$\frac{s+3}{(s^2+3s+2)} = \frac{s+3}{(s+1)(s+2)} = \frac{K_1}{(s+1)} + \frac{K_2}{(s+2)}; \; K_2=?$$
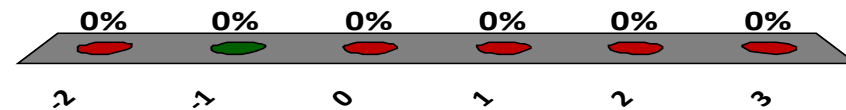
A. -2

B. -1

C. 0

D. 1

E. 2

F. 3

0%   0%   0%   0%   0%   0%

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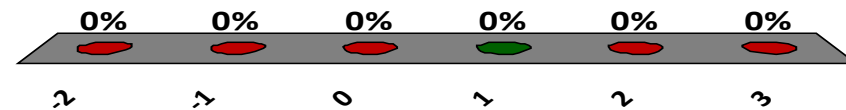$$\frac{s}{(s+1)^2} = \frac{K_1}{(1+s)^2} + \frac{K_2}{1+s}$$

$K_1 = ?$

A. -2

B. -1

C. 0

D. 1

E. 2

F. 3

$$\frac{s}{(s+1)^2} = \frac{K_1}{(1+s)^2} + \frac{K_2}{1+s}$$

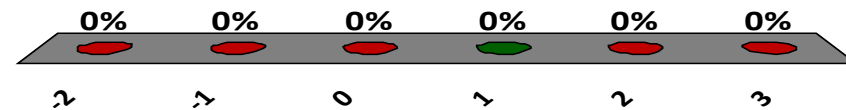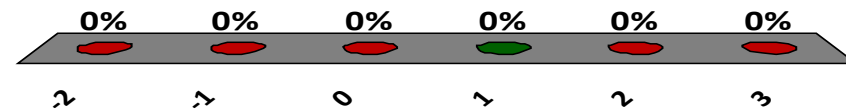$K_2 = ?$

A. -2

B. -1

C. 0

D. 1

E. 2

F. 3

Expand: $\dfrac{s^2}{(s+1)^2}$

A. $1-1/(1+s)^2+2/(1+s)$

B. $1-1/(1+s)^2-2/(1+s)$

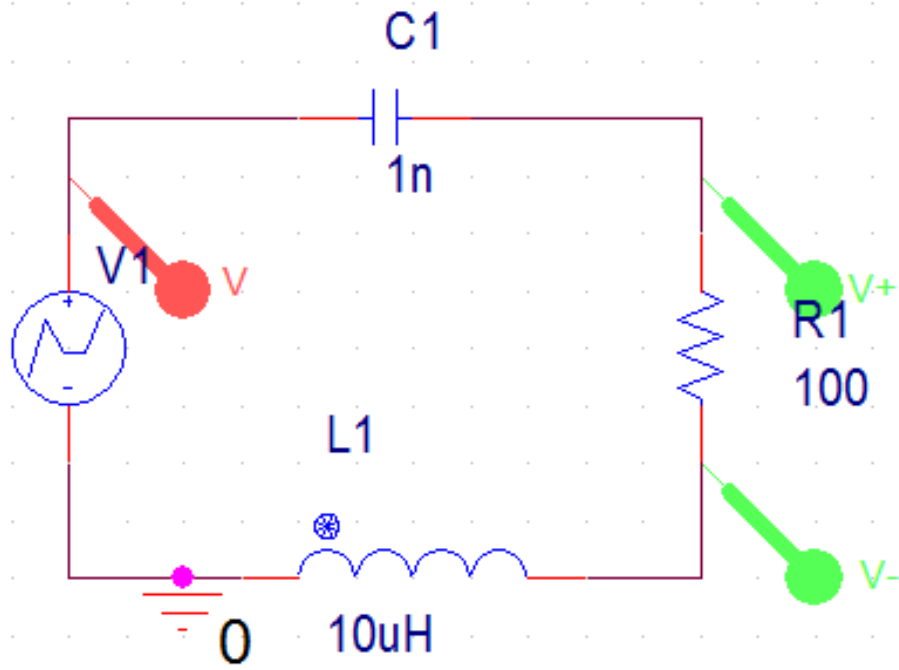C. $1+1/(1+s)^2+2/(1+s)$

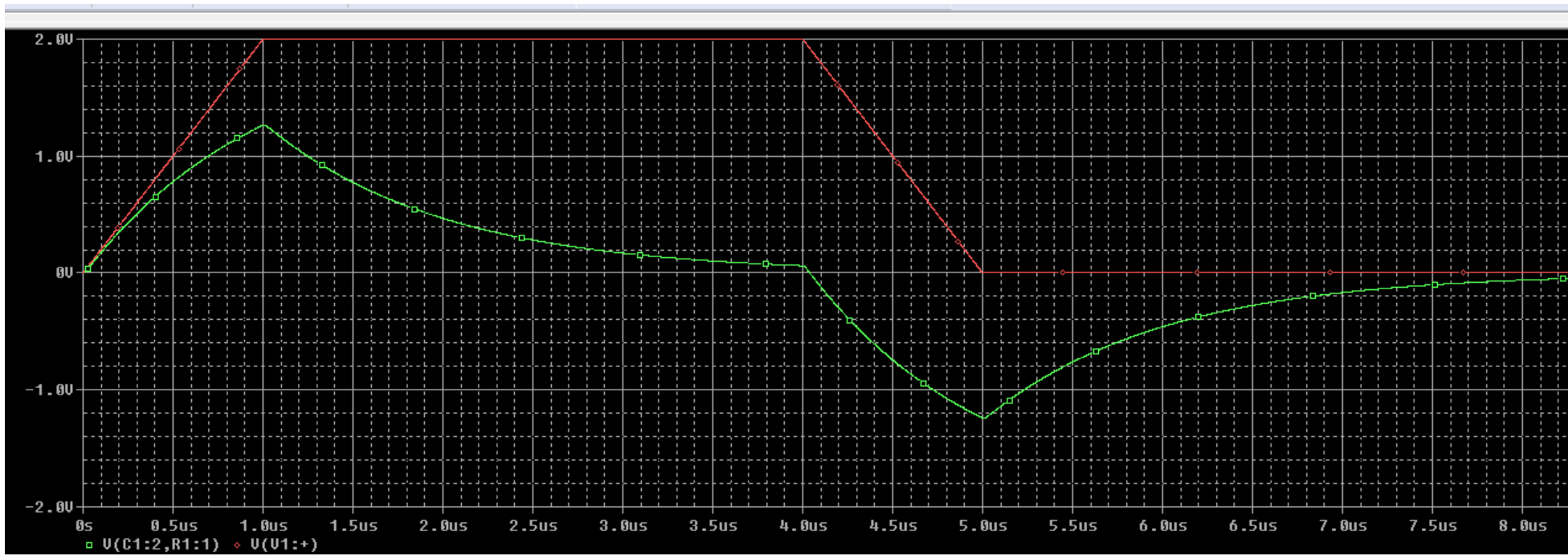D. $1+1/(1+s)^2-2/(1+s)$

0% 0% 0% 0% 0% 0%

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ILT of $1+1/(1+s)^2-2/(1+s)$?

A. $e^{-t}(\delta(t)+t+2)$

B. $e^{-t}(\delta(t)+t-2)$

C. $e^{-t}(\delta(t)-t-2)$

D. $e^{-t}(-\delta(t)+t-2)$

$$\frac{s^4}{\left(2 + 2\,s + s^2\right)^2}$$
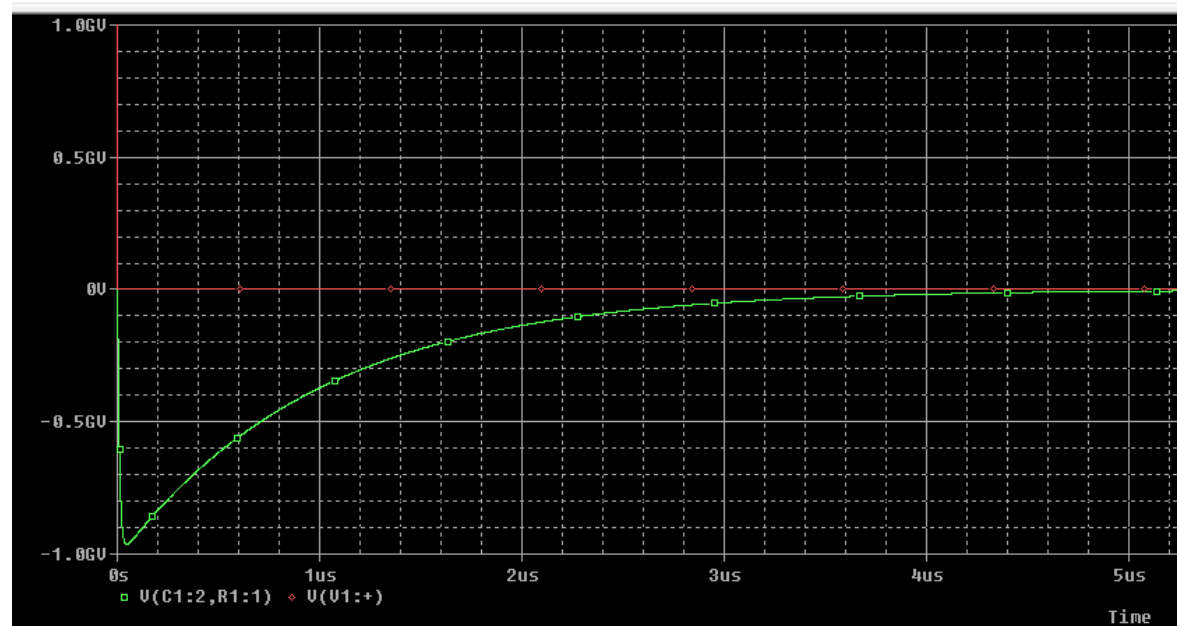
	A
	⊞ SCHEMATIC1 : PAGE1
PSpiceTemplate	V^@REFDES %+ %- ?DC|D
Reference	V1
Source Library	C:\CADENCE\SPB_17.2 ⬚
Source Package	VPWL
Source Part	VPWL.Normal
T1	0
T2	1u
T3	4u
T4	5u
T5	
T6	
T7	
T8	
V1	0
V2	1
V3	1
V4	0
V5	
V6	
V7	

Impulse response
Transfer function
Convolution