

# CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT



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## School of Engineering and Technology

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### Assignment -1

Subject Name-Laplace & Fourier Transform (CUTM1002)

1	$L^{-1} \left[ \frac{1}{s-a^2} \right]$ is:
	$\sin at$
	$\frac{\sin hat}{a}$
	$e^{a^2t}$
	None of the above
2	$L[4t^2]$
	$\frac{4}{s^3}$
	$\frac{8}{s^3}$
	$\frac{16}{t^2}$
	None of the above
3	Whose Laplace Transform is $\frac{1}{s^2-4}$
	$\sin 2t$
	$2\sin h2t$
	$\frac{1}{s}\cos h2t$
	$\frac{1}{2}\sin h 2t$
4	Which of the following is correct?
	$f(s) = \iint_0^\infty e^{-st} f(t) dt$
	$F(s) = \int_0^\infty e^{-st} f(t) dt$
	$F(s) = \int_0^\infty e^{st} f(t) dt$
	None of these
5	Which of the following is not true?
	$L^{-1} \left( \frac{e^{-as}}{s} \right) = u(t-a)$
	$L^{-1}[e^{-as}F(s)] = f(t-a)u(t-a)$
	$L^{-1} \left[ \frac{1}{s}F(s) \right] = \int_0^\infty e^{-st} f(t) dt$

	None of these
6	Which of the following is true?
	$L^{-1}\left(\frac{e^{-3s}}{s}\right) = u(t-3)$
	$L^{-1}\left(\frac{1}{s^2-5}\right) = \frac{1}{5} \sin h5t$
	$L(te^{2t}) = \frac{1}{(s-2)^2}$
	None of these
7	Which of the following is false?
	$L(2021 \cos 0) = 0$
	$L(2021 \sin 0) = 0$
	$L^{-1}\left(\frac{1}{(s-3)^2}\right) = te^{3t}$
	None of these
8	$L^{-1}\left(\frac{2s}{(s^2+1)^2}\right)$ is:
	$t \sin t$
	$t \cos t$
	$\frac{1}{t} \sin t$
	$\frac{1}{t} \cos t$
9	$\Gamma(0)$ is
	0
	-1
	1
	undefined
10	$L^{-1}\left[\frac{1}{s^2+4s+24}\right]$ is
	$e^{-2t} \sin 20t$
	$\frac{e^{-2t}}{20} \sin 20t$
	$\frac{e^{-2t}}{20} \sin 2\sqrt{5}t$
	None of these
11	$L^{-1}\left(\frac{2as}{(s^2-a^2)^2}\right)$ is:
	$t \cosh at$
	$t \sinh t$
	$t \sinh at$
	None of these

12	Which of the following is true?
	$L^{-1}\left(\frac{s}{(s^2-2^2)^2}\right) = t \sin ht$
	$L^{-1}\left(\frac{s}{(s^2+2^2)^2}\right) = \frac{1}{4} t \sin 2t$
	$L^{-1}\left(\frac{s^2+2}{(s^2-2^2)^2}\right) = \frac{1}{4} t \sin h\sqrt{2}t$
	None of these
13	$L^{-1}\left(\frac{e^{-2s}}{s^2+1}\right)$ is:
	$\sin(t-2)u(t-2)$
	$\cos(t-1)u(t-2)$
	$\sin(t-1)u(t-2)$
	None of these
14	Solution 'y' for $y'+2y = 0$ by Laplace transform when $y(0) = 1.5$ is
	$1.5 e^{-2t}$
	$1.5 e^{2t}$
	$1.5 e^{-3t}$
	None of the above
15	$L\{u(t-1)\}$ is:
	$e^{-s}$
	$e^s$
	$e^{4s}$
	None of the above
16	$L^{-1}\left(\frac{se^{-\pi s}}{s^2-4}\right)$ is:
	$\cos h(t-\pi)u(t+\pi)$
	$\sin h(t-\pi)u(t-\pi)$
	$\sin(t-\pi)u(t-\pi)$
	$\cos h(2t-2\pi)u(t-\pi)$
17	$L[tu(t-3)]$ is:
	$e^{-2s}\left(\frac{1}{s^2} + \frac{1}{s}\right)$
	$e^{-3s}\left(\frac{1}{s} - \frac{1}{s^2}\right)$
	$e^{3s}\left(\frac{1}{s} - \frac{3}{s^2}\right)$
	None of these
18	$L^{-1}[tu(t-\pi)]$ is:
	$e^{\pi s}\left(\frac{1}{s} + \frac{\pi}{s^2}\right)$
	$e^{\pi s}\left(\frac{1}{s} - \frac{\pi}{s^2}\right)$
	$e^{-\pi s}\left(\frac{1}{s^2} + \frac{\pi}{s}\right)$
	None of these.
19	$L^{-1}\left[\frac{1}{s^2+2}\right]$ is:
	$\frac{1}{2} \sin 2t$
	$\frac{1}{\sqrt{2}} \cos \sqrt{2}t$

	$\frac{1}{\sqrt{2}} \sin \sqrt{2}t$
	None of the above
20	The fundamental period of $\cos 2\pi x$ is
	0
	1
	2
	None of these
21	If $m \neq n$ then the value of $\int_{-\pi}^{\pi} \sin mx \cos nx \, dx$ is
	1
	0
	x
	None of these
22	Given function $f(x) =  \sin x $
	An even function
	An odd function
	Neither even nor odd function
	None of these
23	Which of the following represents Fourier coefficients?
	The terms that are present in a Fourier series
	The terms which consist of the Fourier series along with their sine or cosine value
	The terms that are obtained through Fourier series
	None of these
24	A "periodic function" is given by a function which
	Has a period $T = 2\pi$
	satisfies $f(t+T) = -f(t)$
	satisfies $f(t+T) = f(t)$
	has a period $T = \pi$
25	Half range cosine Fourier series, we assume the function to be _____

	Odd function
	Can't be determined
	Even function
	None of these
26	Find the Fourier transform of $f(x) = \begin{cases} 1, & -a < x < a \\ 0, & \text{otherwise} \end{cases}$
	$\cos wa$
	$\frac{1}{\sqrt{2\pi}} \left( \frac{2\sin wa}{w} \right)$
	$\frac{1}{\sqrt{2\pi}} \left( \frac{\cos wa}{w} \right)$
	None of these
27	Inverse Fourier sine transformation of $f(x)$ is
	$\frac{2}{\pi} \int_0^{\infty} \hat{f}_s(w) \cos wx \, dw$
	$\frac{2}{\pi} \int_0^{\infty} \hat{f}_c(w) \sin wx \, dw$
	$\sqrt{\frac{2}{\pi}} \int_0^{\infty} \hat{f}_s(w) \cos wx \, dw$
	$\sqrt{\frac{2}{\pi}} \int_0^{\infty} \hat{f}_s(w) \sin wx \, dw$
28	The Fourier complex integral form can be written in the form of Fourier transform is
	$\frac{1}{2\pi} \int_{-\infty}^{\infty} e^{-iwt} \hat{f}(w) \, dw$
	$\frac{1}{\pi} \int_{-\infty}^{\infty} e^{-iwt} \hat{f}(w) \, dw$
	$\frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} e^{iwt} \hat{f}(w) \, dw$
	$\frac{1}{\pi} \int_{-\infty}^{\infty} e^{iwt} f(w) \, dw$
29	Find the sine transform of $f(x) = \begin{cases} \sin x, & 0 \leq x \leq a \\ 0, & \text{otherwise} \end{cases}$

	$\frac{1}{\sqrt{2\pi}} \left[ \frac{\cos(1-w)a}{1-w} - \frac{\cos(1+w)a}{1+w} \right]$
	$\frac{1}{\sqrt{2\pi}} \left[ \frac{\sin(1-w)a}{1-w} - \frac{\sin(1+w)a}{1+w} \right]$
	$\frac{1}{2\pi} \left[ \frac{\sin(1-w)a}{1-w} - \frac{\cos(1+w)a}{1+w} \right]$
	$\frac{1}{2\pi} \left[ \frac{\cos(1-w)a}{1-w} - \frac{\sin(1+w)a}{1+w} \right]$
30	Linearity Property formula of the Fourier transform is:
	$\mathcal{F}(ag + bf) = a \mathcal{F}(g) + b \mathcal{F}(f)$
	$\mathcal{F}(af + bg) = a \mathcal{F}(f) - b \mathcal{F}(g)$
	$\mathcal{F}(af - bg) = a \mathcal{F}(f) + b \mathcal{F}(g)$
	None of these.