

PhysicsByAaryan

CSIR NET . GATE . JEST . BARC - Physics

Laplace transform - CSIR NET Physics PYQs

Mathematical Physics . All PYQs (2015-2025) with answer key

4 questions . Answer key included

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Q1. [June 2015] . 3.5 marks

Mathematical Physics > Laplace transform

CSIR NET	2015 June	3.5 M
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The Laplace transform of $6t^3 + 3\sin 4t$ is

1. $\frac{36}{s^4} + \frac{12}{s^2+16}$
2. $\frac{36}{s^4} + \frac{12}{s^2-16}$
3. $\frac{18}{s^4} + \frac{12}{s^2-16}$
4. $\frac{36}{s^3} + \frac{12}{s^2+16}$

Q2. [Dec 2016] . 3.5 marks

Mathematical Physics > Laplace transform

CSIR NET	2016 Dec	3.5M
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The Laplace transform of

$$f(t) = \begin{cases} \frac{t}{T}, & 0 < t < T \\ 1 & t > T \end{cases} \text{ is}$$

1. $-(1 - e^{-sT})/s^2T$
2. $(1 - e^{-sT})/s^2T$
3. $(1 + e^{-sT})/s^2T$
4. $(1 - e^{sT})/s^2T$

Q3. [Dec 2017] . 3.5 marks

Mathematical Physics > Laplace transform

CSIR NET	2017 Dec	3.5M
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Consider the differential equation $\frac{dy}{dt} + ay = e^{-bt}$ with the initial condition $y(0) = 0$. Then the Laplace transform $Y(s)$ of the solution $y(t)$ is

1. $\frac{1}{(s+a)(s+b)}$

2. $\frac{1}{b(s+a)}$

3. $\frac{1}{a(s+b)}$

4. $\frac{e^{-a} - e^{-b}}{b-a}$

Q4. [June 2022] . 5.0 marks

Mathematical Physics > Laplace transform

CSIR NET	2022 June	5M
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The Laplace transform $L[f](y)$ of the function

$$f(x) = \begin{cases} 1 & \text{for } 2n \leq x \leq 2n + 1 \\ 0 & \text{for } 2n + 1 \leq x \leq 2n + 2 \end{cases}, n = 0, 1, 2, \dots \text{ is}$$

1. $\frac{e^{-y}(e^{-y}+1)}{y(e^{-2y}+1)}$

2. $\frac{e^y - e^{-y}}{y}$

3. $\frac{e^y + e^{-y}}{y}$

4. $\frac{e^y(e^y - 1)}{y(e^{2y} - 1)}$

Answer Key

4 questions . Subject and topic for quick revision

Q. No	Subject	Topic	Answer
Q1	Mathematical Physics	Laplace transform	1
Q2	Mathematical Physics	Laplace transform	2
Q3	Mathematical Physics	Laplace transform	1
Q4	Mathematical Physics	Laplace transform	4

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