PhysicsByAaryan

CSIR NET . GATE . JEST . BARC - Physics

Gamma and beta functions - CSIR NET Physics PYQs

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

3 questions . Answer key included

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Q1. [June 2022] . 3.5 marks

Mathematical Physics > Gamma and beta functions

CSIR NET	2022 June	3.5M

The value of the integral $\int_0^\infty dxe^{-x^{2m}}$, where m is a positive integer, is

1. $\Gamma\left(\frac{m+1}{2m}\right)$
2. $\Gamma\left(\frac{m-1}{2m}\right)$
3. $\Gamma\left(\frac{2m+1}{2m}\right)$
4. $\Gamma\left(\frac{2m-1}{2m}\right)$

Q2. [Dec 2023] . 3.5 marks

Mathematical Physics > Gamma and beta functions

CSIR NET	2023 Dec	3.5 M

The Beta function is defined as

$$B(x,y) = \int_0^1 t^{x-1}(1-t)^{y-1}dt.$$

Then $B(x,y+1) + B(x+1,y)$ can be expressed as

1. $B(x,y-1)$
2. $B(x+y,1)$
3. $B(x+y,x-y)$
4. $B(x,y)$

Q3. [June 2024] . 3.5 marks

Mathematical Physics > Gamma and beta functions

CSIR NET	2024 June	3.5M

An integral is given by

$$\int_{-\infty}^{\infty} dx \int_{-\infty}^{\infty} dy \exp\left[-\left(x^2 + y^2 + 2axy\right)\right],$$

where a is a real parameter. The full range of values of a for which the integral is finite, is

1. $-\infty < a < \infty$
2. $-2 < a < 2$
3. $-1 < a < 1$
4. $-1 \leq a \leq 1$

Answer Key

3 questions . Subject and topic for quick revision

Q. No	Subject	Topic	Answer
Q1	Mathematical Physics	Gamma and beta functions	**3**
Q2	Mathematical Physics	Gamma and beta functions	**4**
Q3	Mathematical Physics	Gamma and beta functions	**3**

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