

IIT JAM Mathematics Most Repeated Questions

You can check the list of 25 most repeated questions of IIT JAM Mathematics, based on previous year 2021, 2022, 2023, 2024 and 2025 official question paper analysis.

Question: Let $0 < \alpha < 1$. The number of differentiable functions $y: [0, 1] \rightarrow [0, \infty)$ with continuous derivative satisfying $y'(t) = (y(t))^\alpha$, $y(0) = 0$, is:

Options:

A. Exactly one | B. Exactly two | C. Finite but more than two | D. Infinite

Correct Answer: D. Infinite

2. Question: If $f(x) = f(x+1)f(x)$ for all $x \in \mathbb{R}$, then:

Options:

A. Not necessarily bounded above | B. $\exists$ unique x_0 such that $f(x_0 + \pi) = f(x_0)f(x_0 + \pi)$ | C. No such x_0 exists | D. Infinitely many x_0 such that $f(x_0 + \pi) = f(x_0)f(x_0 + \pi)$

Correct Answer: D. Infinitely many x_0

3. Question: How many elements of the group $\mathbb{Z}_{50}$ have order 10?

Options:

A. 10 | B. 4 | C. 5 | D. 8

Correct Answer: B. 4

4. Question: Let $f(x) = \sum_{n=1}^{\infty} \cos(nx) n^2$

$\frac{\cos(nx)}{n^2}$. Then f is:

Options:

A. Continuous and differentiable everywhere | B. Not differentiable at some points | C. Piecewise differentiable | D. Discontinuous at some points

Correct Answer: A. Continuous and differentiable everywhere

5. Question: Let f be continuous and $\int_0^1 f(x) dx = 0$ for all $x \in \mathbb{R}$. Then:

Options:

A. $f \equiv 0$ | B. f is zero at some points | C. f takes both positive and negative values | D. f is discontinuous

Correct Answer: A. $f \equiv 0$

6. Question: Let $\sum_{n=1}^{\infty} \frac{f(n)}{n^2} < \infty$ where $f: \mathbb{N} \rightarrow \mathbb{N}$ is bijective. Then number of such bijections:

Options:

A. Exactly one | B. Zero | C. Infinite | D. Finite but more than one

Correct Answer: C. Infinite

7. Question: Evaluate $\lim_{n \rightarrow \infty} \prod_{k=2}^n (1 - \frac{1}{k^2})$

Options:

A. 1 | B. 1/2 | C. 1/4 | D. 3/4

Correct Answer: B. 1/2

8. Question: Which of the following is true?

Options:

A. $(\mathbb{Z}, +) \cong (\mathbb{R}, +)$ | B. $(\mathbb{Q}, +)$ has no proper subgroup of finite index | C. All subgroups of $C^*(\mathbb{C})$ are infinite | D. $\mathbb{Q}$ has a subgroup of index 2

Correct Answer: B. $(\mathbb{Q}, +)$ has no proper subgroup of finite index

9. Question: Which subset of $\mathbb{R}$ has non-empty interior?

Options:

A. Irrational numbers | B. $\{x : \sin(x) = 1\}$ | C. $\{b \in \mathbb{R} : x^2 + bx + 1 \text{ has distinct roots}\}$ | D. Rational numbers

Correct Answer: C. Discriminant condition gives open set

10. Question: If $A^k = I_n$, then all eigenvalues of A are:

Options:

A. Real | B. Complex numbers of modulus 1 | C. k-th roots of unity | D. Zero

Correct Answer: C. k-th roots of unity

11. Question: The radius of convergence of $\sum_{n=0}^{\infty} \frac{x^n}{n!}$ is:

Options:

A. ∞ | B. 0 | C. 1 | D. e

Correct Answer: B. 0

12. Question: The function $f(x) = x \sin(1/x)$ for $x \neq 0$, and $f(0) = 0$ is:

Options:

A. Continuous but not differentiable at 0 | B. Differentiable at 0 | C. Discontinuous at 0 | D. Not defined at 0

Correct Answer: B. Differentiable at 0

13. Question: Let A be a 3×3 matrix with trace zero. Then $\det(e^A)$ is:

Options:

A. 0 | B. 1 | C. e | D. -1

Correct Answer: B. 1

14. Question: If f is entire and bounded, then f is:

Options:

A. Constant | B. Polynomial | C. Rational | D. Periodic

Correct Answer: A. Constant

15. Question: $\int_{-\infty}^{\infty} e^{-x^2} dx$ is:

Options:

A. $\sqrt{\pi}$ | B. 1 | C. π | D. 2π

Correct Answer: A. $\sqrt{\pi}$

16. Question: If a linear transformation T satisfies $T^2 = TT^2 = T$, then T is:

Options:

A. Invertible | B. Idempotent | C. Nilpotent | D. Diagonalizable

Correct Answer: B. Idempotent

17. Question: Number of 2×2 matrices with entries 0 or 1:

Options:

A. 4 | B. 8 | C. 16 | D. 32

Correct Answer: C. 16

18. Question: Which of the following sequences converges?

Options:

A. $(-1)^n$ | B. n^2 | C. $1/n$ | D. $\sin(n)$

Correct Answer: C. $1/n$

19. Question: If A is symmetric, then ATA^T is:

Options:

A. Skew symmetric | B. Diagonal | C. A | D. Zero

Correct Answer: C. A

20. Question: $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$ is:

Options:

A. 0 | B. 1 | C. e | D. ∞

Correct Answer: B. 1

21. Question: Number of real roots of $x^3 + x + 1 = 0$:

Options:

A. 0 | B. 1 | C. 2 | D. 3

Correct Answer: B. 1

22. Question: Let A be 2×2 matrix with eigenvalues 3 and 5. Then $\text{trace}(A) =$

Options:

A. 15 | B. 8 | C. 2 | D. 0

Correct Answer: B. 8

23. Question: If $f(x) = \ln(x)$, then $f'(e) =$:

Options:

A. 1 | B. e | C. 0 | D. 1/e

Correct Answer: D. 1/e

24. Question: If A is invertible, then $\det(A^{-1}) = \det(A^{-1}) = \det(A^{-1}) =$:

Options:

A. 0 | B. 1 | C. $1/\det(A)$ | D. $-\det(A)$

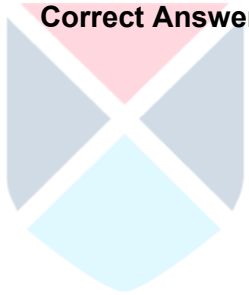
Correct Answer: C. $1/\det(A)$

25. Question: If x is irrational, then $\sin(x)\sin(x)\sin(x)$ is:

Options:

A. Rational | B. Always 1 | C. Irrational | D. Cannot be determined

Correct Answer: D. Cannot be determined



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