

JEE MAIN SEQUENCES AND SERIES — SUM OF SERIES BY DIFFERENCE / TELESCOPING METHOD (JEE) — PYQS

Max. Marks: 52

Questions: 13

Section A (MCQ) — 10 questions

Q.1 $\sum_{n=1}^{10} \left(\frac{528}{n(n+1)(n+2)} \right)$ is equal to:

[JEE Main 2026 (Online) 5th April Morning Shift]

- (1) 65 (2) 130 (3) 220 (4) 440

 Scan or tap for the
full solution


Q.2 If the sum of the first 10 terms of the series $\frac{1}{1+1^4 \times 4} + \frac{2}{1+2^4 \times 4} + \frac{3}{1+3^4 \times 4} + \frac{4}{1+4^4 \times 4} + \dots$ is $\frac{m}{n}$, $\gcd(m, n) = 1$, then $m + n$ is equal to :

[JEE Main 2026 (Online) 5th April Evening Shift]

- (1) 256 (2) 264 (3) 276 (4) 284

 Scan or tap for the
full solution


Q.3 If the sum of the first 20 terms of the series $\frac{4 \cdot 1}{4+3 \cdot 1^2+1^4} + \frac{4 \cdot 2}{4+3 \cdot 2^2+2^4} + \frac{4 \cdot 3}{4+3 \cdot 3^2+3^4} + \frac{4 \cdot 4}{4+3 \cdot 4^2+4^4} + \dots$ is $\frac{m}{n}$, where m and n are coprime, then $m + n$ is equal to :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) 423 (2) 421 (3) 422 (4) 420

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full solution


Q.4 The sum $1 + 3 + 11 + 25 + 45 + 71 + \dots$ upto 20 terms, is equal to

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 7240 (2) 8124 (3) 7130 (4) 6982

 Scan or tap for the
full solution


Q.5 For positive integers n , if $4a_n = (n^2 + 5n + 6)$ and $S_n = \sum_{k=1}^n \left(\frac{1}{a_k} \right)$, then the value of $507S_{2025}$ is :

[JEE Main 2025 (Online) 28th January Evening Shift]

- (1) 540 (2) 675 (3) 1350 (4) 135

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full solution


Q.6 Let $S_n = \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \dots$ upto n terms. If the sum of the first six terms of an A.P. with first term $-p$ and common difference p is $\sqrt{2026S_{2025}}$, then the absolute difference between 20th and 15th terms of the A.P. is

[JEE Main 2025 (Online) 24th January Morning Shift]

- (1) 20 (2) 45 (3) 90 (4) 25

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full solution


Q.7 If $\sum_{r=1}^n T_r = \frac{(2n-1)(2n+1)(2n+3)(2n+5)}{64}$, then $\lim_{n \rightarrow \infty} \sum_{r=1}^n \left(\frac{1}{T_r} \right)$ is equal to :

[JEE Main 2025 (Online) 22nd January Morning Shift]

- (1) $\frac{2}{3}$ (2) $\frac{1}{3}$ (3) 1 (4) 0

 Scan or tap for the
full solution


Q.8 If the sum of the series $\frac{1}{1 \cdot (1+d)} + \frac{1}{(1+d)(1+2d)} + \dots + \frac{1}{(1+9d)(1+10d)}$ is equal to 5, then $50d$ is equal to :

[JEE Main 2024 (Online) 9th April Morning Shift]

- (1) 5 (2) 10 (3) 15 (4) 20

 Scan or tap for the
full solution


Q.9 If $\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \dots + \frac{1}{\sqrt{99} + \sqrt{100}} = m$ and $\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \dots + \frac{1}{99 \cdot 100} = n$, then the point (m, n) lies on the line

[JEE Main 2024 (Online) 5th April Morning Shift]

- (1) $11(x-1) - 100y = 0$
 (2) $11x - 100y = 0$
 (3) $11(x-1) - 100(y-2) = 0$
 (4) $11(x-2) - 100(y-1) = 0$

 Scan or tap for the
full solution


Q.10 The sum of the series

$$\frac{1}{1-3 \cdot 1^2+1^4} + \frac{2}{1-3 \cdot 2^2+2^4} + \frac{3}{1-3 \cdot 3^2+3^4} + \dots \text{ up to 10-terms is}$$

[JEE Main 2024 (Online) 31st January Morning Shift]

- (1) $\frac{45}{109}$ (2) $-\frac{55}{109}$ (3) $\frac{55}{109}$ (4) $-\frac{45}{109}$

Scan or tap for the full solution



Section B (Numerical) — 3 questions

Q.11 If $\sum_{r=1}^{25} \left(\frac{r}{r^4+r^2+1} \right) = \frac{p}{q}$, where p and q are positive integers such that $\gcd(p, q) = 1$, then p + q is equal to _____.

[JEE Main 2026 (Online) 28th January Evening Shift]

Scan or tap for the full solution



Q.12 If the sum of the first 10 terms of the series $\frac{4 \cdot 1}{1+4 \cdot 1^4} + \frac{4 \cdot 2}{1+4 \cdot 2^4} + \frac{4 \cdot 3}{1+4 \cdot 3^4} + \dots$ is $\frac{m}{n}$, where $\gcd(m, n) = 1$, then m + n is equal to _____.

[JEE Main 2025 (Online) 2nd April Evening Shift]

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Q.13 If $\left(\frac{1}{\alpha+1} + \frac{1}{\alpha+2} + \dots + \frac{1}{\alpha+1012} \right) - \left(\frac{1}{2 \cdot 1} + \frac{1}{4 \cdot 3} + \frac{1}{6 \cdot 5} + \dots + \frac{1}{2024 \cdot 2023} \right) = \frac{1}{2024}$, then α is equal to _____.

[JEE Main 2024 (Online) 9th April Evening Shift]

Scan or tap for the full solution



ANSWER KEY

Section A (MCQ) — 10 questions

Ques.	1	2	3	4	5	6	7	8	9	10	
Ans.	2	3	2	1	2	4	1	1	2	2	

Section B (Numerical) — 3 questions

Ques.	11	12	13				
Ans.	976	441	1011				