MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

MATHEMATICAL INDUCTION AND SUMMATION OF SERIES

Question Bank

1. $1+3+5+\ldots.+(2n-1)=$

A. n^2+1

B. $2n$

C. n^2

D. n^2-1

Answer: C

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2. Sum to n terms of $2 + 4 + 6 + 8. . =$

A. 1)$n(n + 1)$

B. 2)$n(2n - 1) + 1$

C. 3)$n^2(n + 1)$

D. 4)$\frac{n(n + 1)}{2}$

Answer: A

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3. Sum to n terms of the series $1 + (1 + 2) + (1 + 2 + 3) + \ldots .$

A. $\frac{1}{6}(n^3 + 3n^2 + 2n)$

B. $\frac{1}{2}(n^3 - 3n^2 + 4n)$

C. $\frac{1}{5}(n^3 + 3n^2 + n)$

D. $\frac{1}{3}\left(n^3+3n^2-1\right)$

Answer: A

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4. $1.3+3.5+5.7+\ldots.$ to n terms =

A. 1) $\frac{n}{5}\left(3n^2+7n+5\right)$

B. 2) $\frac{n}{2}\left(2n^2+3n+1\right)$

C. 3) $\frac{n}{3}\left(4n^2+6n-1\right)$

D. 4) $\frac{n}{4}\left(4n^2+6n+2\right)$

Answer: C

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5. $2.4+4.6+6.8+\ldots$ to n terms =

A. $\frac{4}{3}n(n+1)(n+2)$

B. $4n(n+1)$

C. $\frac{8}{3}n(n+2)$

D. $\frac{4}{3}(n+1)(n+2)$

Answer: A

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6. (b) Find the sum to n terms of the series $1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + \ldots$

A. $\frac{1}{3}[n(n+1)(n+2)(n+3)]$

B. $\frac{1}{3}[n(n+1)(n+2)]$

C. $\frac{1}{4}[n(n+1)(n+2)(n+3)]$

D. $\frac{1}{4}[n(n+1)(n+2)]$

Answer: C

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7. $1+\frac{1+2}{2}+\frac{1+2+3}{3}+\frac{1+2+3+4}{4}+\ldots$ to n terms =

A. $\frac{1}{3}[n(n+2)]$

B. $\frac{1}{4}[n(n+3)]$

C. $\frac{1}{5}[n(n+4)]$

D. $\frac{1}{2}[n(n+1)]$

Answer: B

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8. The sum of first 9 terms of the series :

$\frac{1^3}{1}+\frac{1^3+2^3}{1+3}+\frac{1^3+2^3+3^3}{1+3+5}+\ldots.$ is :

A. $\frac{1}{4}[n(n+3)]$

B. $\frac{1}{12}[n(n+2)(n+3)]$

C. $\frac{1}{3}[n(n+2)]$

D. $\frac{1}{6}[n(n+1)(n+2)]$

Answer: D

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9. The sum of $\frac{1^3}{1}+\frac{1^3+2^3}{1+2}+\frac{1^3+2^3+3^3}{1+2+3}+\ldots$ upto 10 terms is

A. a.330

B. b.220

C. c.440

D. d.550

Answer: B

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10. Sum to n terms of the series $\frac{1}{2.5}+\frac{1}{5.8}+\frac{1}{8.11}+..=$

A. 1) $\frac{1}{2(2n+3)}$

B. 2) $\frac{2n}{5(3n+1)}$

C. 3) $\frac{n}{2(3n+2)}$

D. 4) $\frac{3n}{5(5n+1)}$

Answer: C

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11. $\frac{1}{1.3}+\frac{1}{3.5}+\frac{1}{5.7}+..$ to $n$terms =

A. 1) $\frac{2n}{2n+1}$

B. 2) $\frac{n}{2n+1}$

C. 3) $\frac{n}{n+2}$

D. 4) $\frac{2n}{n+5}$

Answer: B

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12. If $S_n = \frac{1}{1.4} + \frac{1}{4.7} + \frac{1}{7.10} + \ldots\ldots$ to n terms, then $\lim_{n \to \infty} S_n$ equals :

A. $\frac{2n}{3n+5}$

B. $\frac{n}{3n+1}$

C. $\frac{3n}{4n+8}$

D. $\frac{n}{n+3}$

Answer: B

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13. $\frac{1}{1.4.7} + \frac{1}{4.7.10} + \frac{1}{7.10.13} + \ldots$ to n terms =

A. $\frac{n(3n-5)}{8(3n+1)(3n+4)}$

B. $\frac{n(3n+2)}{6(3n+1)(3n+4)}$

C. $\frac{n(3n+5)}{8(3n+1)(3n+4)}$

D. none of these

Answer: C

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14. Sum of the n terms of the series $1.\ 2^2 + 2.\ 3^2 + 3.\ 4^2 + ..$

A. 1) $\frac{1}{12}[n(n+1)(n+2)(3n+5)]$

B. 2) $\frac{1}{12}[n(n+1)(n+2)(2n+5)]$

C. 3) $\frac{1}{12}[n(n+1)(n+2)(n+5)]$

D. 4) $\frac{1}{12}[n(n+1)(n+2)(2n+3)]$

Answer: A

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15. If t_n denotes the nth term of the series :

$2 + 3 + 6 + 11 + 18 + \ldots\ldots\ldots$, then t_{50} is :

A. $(49)^2 - 1$

B. $(49)^2 + 2$

C. 50^2

D. $(50)^2 - 1$

Answer: B

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16. Sum to n terms of the series$1 + 3 + 7 + 13 + \ldots =$

A. 1 $\frac{n(3n^2 - 1)}{2}$

B. 2: $\frac{n(n^2 + 2)}{3}$

C. 3: $\frac{n(2n^2 + 1)}{3}$

D. 4: $\frac{n(4n^2-1)}{3}$

Answer: B

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17. Sum to n terms of the series$3+15+35+63+\ldots.$

A. 1) $\frac{n}{4}(4n^2+6n+2)$

B. 2)$\frac{n}{3}(2n^2+6n+1)$

C. 3)$\frac{n}{3}(4n^2+6n-1)$

D. 4)$\frac{n}{3}(4n^2+6n-1)$

Answer: C

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18. The n^{th} term of the series $1+5+12+22+35+\ldots.$

A. 1: $\frac{1}{4}(3n^2+n)$

B. 2: $\frac{1}{2}(3n^2-n)$

C. 3: $\frac{1}{3}(2n^2+1)$

D. 4: $\frac{n(4n-1)}{3}$

Answer: C

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19. Sum to n terms of the series$2+6+12+20+..$ is,

A. $\frac{n(n+1)(n+2)}{3}$

B. $\frac{n(n+1)(2n+3)}{5}$

C. $\frac{n(n+3)(2n+1)}{6}$

D. $\frac{n(n+1)^2}{2}$

Answer: A

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20. Sum of n terms of the series

$1 + 2x + 3x^2 + 4x^3 + \ldots, (x \neq 1)$ is

A. 1) $\frac{1 - x^n}{(1 - x)^2} - \frac{nx^n}{1 - x}$

B. 2) $\frac{1 + x^n}{(1 + x)^2} - \frac{nx^n}{1 - x}$

C. 3) $\frac{(1 - x)^n}{(1 + x)^2} - \frac{nx^n}{1 + x}$

D. 4) $\frac{1 + x^n}{(1 - x)^n} - \frac{nx^n}{1 - x}$

Answer: A

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21. Sum of 25 terms of the series

$1 + \frac{2}{2} + \frac{3}{2^2} + \frac{4}{2^3} + \ldots.$

A. $4 - 54\left(\frac{1}{2}\right)^{24}$

B. $4 + 55\left(\frac{1}{2}\right)^{25}$

C. $4-54\left(\frac{1}{2}\right)^{25}$

D. $4-55\left(\frac{1}{2}\right)^{25}$

Answer: C

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22. Sum of 25 terms of the series

$1+2.2+3.2^2+4.2^3+5.2^4+..$

A. 1)24.2^{25}

B. 2)$25.2^{25}-1$

C. 3) $25.2^{25}+1$

D. 4) $24.2^{25}+1$

Answer: D

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23. The n^{th} term of the series $1 + 4 + 13 + 40 + \ldots$ is

A. 1) $\frac{1}{4}(3^n + 1)$

B. 2) $\frac{1}{2}(3^{n-1} + 1)$

C. 3) $\frac{1}{2}(3^n - 1)$

D. 4) $\frac{1}{8}(3^{2n} - 1)$

Answer: C

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24. $3 + 5 + 7 +$ .....to n^{th} term is

A. n^2

B. $n^2 - 1$

C. $n(n + 2)$

D. $n^2 - 2$

Answer: C

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25. The n^{th} term of the series$4 + 13 + 28 + 49 + \ldots$ Is

A. $3n^2 + 1$

B. $2n^2 + 1$

C. $3n^2 - 1$

D. $3n^2 + 2$

Answer: A

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26. The $\sum 1^2 + 1 + 2^2 + 2 + 3^2 + 3 + \ldots + n^2 + n$ is

A. $\frac{n^2(n+1)^2}{4}$

B. $\frac{n(n+1)(n+2)}{6}$

C. $\frac{n(n+1)(n+2)}{3}$

D. $\frac{n(n+1)}{2}$

Answer: C

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27. Find the sum to n terms of the series $1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \ldots .$

A. $\frac{n(n+1)^2(n+3)}{12}$

B. $\frac{n(n+1)(n+2)^2}{12}$

C. $\frac{n(n+1)(n+2)}{12}$

D. $\frac{n(n+1)^2(n+2)}{12}$

Answer: D

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28. $\sum_{n=1}^{n} \frac{1}{(4n-1)\left(\frac{4}{t}+3\right)} =$

A. $\frac{2n}{3(4n+3)}$

B. $3n(4n-1)$

C. $\frac{n}{3(3n+4)}$

D. $\frac{n(n+1)^2(n+2)}{12}$

Answer: C

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29. If $1+x^2=\sqrt{3}x$, then $\sum_{n=1}^{24}\left(x^n-\frac{1}{x^n}\right)^2$ equals

A. $\frac{2n}{3(4n+3)}$

B. $3n(4n-1)$

C. $3(4n+3)$

D. $3(4n+3)$

Answer: B

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30. The sum of first 9 terms of the series :

$$\frac{1^3}{1}+\frac{1^3+2^3}{1+3}+\frac{1^3+2^3+3^3}{1+3+5}+\ldots\ldots\ldots \text{ is :}$$

A. $\frac{n+1}{4}$

B. $\frac{n(n+1)}{2}$

C. $\frac{(n+1)^2}{6}$

D. $\frac{(n+1)^2}{4}$

Answer: A

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31. $\frac{1}{1.4}+\frac{1}{4.7}+\frac{1}{7.10}+\ldots\ldots\ldots=$

A. 1) $\frac{n}{3n+1}$

B. 2) $\frac{2n}{3n+1}$

C. 3)` (n)/(3 n+2)

D. 4) $\frac{3n}{3n+2}$

Answer: D

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32. $1+\frac{3}{2}+\frac{5}{2^2}+\frac{7}{2^3}+\ldots.\rightarrow\infty=$

A. 1)4

B. 2)8

C. 3)5

D. 4)6

Answer: B

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33. Sum to n terms of the series$3 + 15 + 35 + 63 + \ldots .$

A. 2500

B. 2499

C. 2501

D. 2400

Answer: A

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34. $\frac{1}{2!} + \frac{2}{3!} + \frac{3}{4!} + \ldots . \rightarrow nterms =$

A. $1 - \frac{1}{(n+1)!}$

B. $1+\frac{1}{(n+1)!}$

C. $1-\frac{1}{n!}$

D. $1+\frac{1}{n!}$

Answer: A

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35. Sum of 10 terms of the series

$$\frac{3}{1^2}+\frac{5}{1^2+2^2}+\frac{7}{1+2^2+3^2}+\ldots$$

A. a. $\frac{60}{11}$

B. b. $\frac{70}{13}$

C. c. $\frac{80}{17}$

D. d. $\frac{90}{19}$

Answer: B

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36. If the sum of n terms of the series :

$\frac{1}{1^3} + \frac{1+2}{1^3+2^3} + \frac{1+2+3}{1^3+2^3+3^3} + \ldots\ldots$ in S_n , then S_n exceeds 199 for all n greater than :

A. $\frac{2}{n+1}$

B. $\frac{2n}{n+1}$

C. $\frac{n}{n+1}$

D. $\frac{1}{n+1}$

Answer: D

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37. Sum of 25 terms of the series $1.3 + 2.5 + 3.7 + \ldots$, is

A. 11370

B. 11374

C. 11372

D. 11375

Answer: C

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38. If the natural numbers are divided into the groups $(1), (2, 3), (4, 5, 6), (7, 8, 9, 10)..$ then the sum of the elements of 25^{th} group is

A. 7820

B. 7850

C. 7825

D. 7840

Answer: D

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39. If $\left(\sum n^3\right)\left(\sum n\right) = \left(\sum n^2\right)^2$, then

A. $n = 3$

B. $n = 1$

C. $n^2 = 3$

D. $n = 1$

Answer: C

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40. $4^3 + 5^3 + 6^3 + \ldots + 10^3 =$

A. 2358

B. 2980

C. 2989

D. 2360

Answer: C

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41. $3 + 5 + 7 +$ .....to n^{th} term is

A. $2n + 1$

B. $3^n - 1$

C. $2^n + 1$

D. $3^n + 1$

Answer: B

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42. $\frac{\frac{1}{2} \cdot \frac{2}{2}}{1^3} + \frac{\frac{2}{3} \cdot \frac{3}{2}}{1^3 + 2^3} + \frac{\frac{3}{2} \cdot \frac{4}{2}}{1^3 + 2^3 + 3^3} + \ldots$. to n terms

A. a. $\frac{1}{n+1}$

B. b. $\frac{n}{n+1}$

C. c. $\frac{2}{n+3}$

D. d. $\frac{3}{n+5}$

Answer: B

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43. The 10^{th} term of the series $3+13+29+51+79+\ldots.$

A. 1.300

B. 2. 309

C. 3.310

D. 4. 312

Answer: A

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44. Sum to 30 terms of $3+4+8+9+13+14+18+19+..$ is

A. 1155

B. 1055

C. 1150

D. 1050

Answer: A

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45. The greatest positive integer, which divides $(n+1)(n+2)(n+3)(n+4)$ for all $n \in N$ is

A. r

B. $r!$

C. $n+r$

D. $(r+1)!$

Answer: B

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46. The sum of cubes of three successive natural numbers is divisible by

A. 6

B. 9

C. 27

D. 8

Answer: B

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47. Product of 4 consecutive natural numbers is divisible by

A. 12

B. 13

C. 24

D. 16

Answer: C

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48. $49^n + 16n - 1$is divisible by

A. 16

B. 64

C. 128

D. 32

Answer: A

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49. If n is a positive integer, then $n^3 + 2n$ is divisible

A. 2

B. 3

C. 6

D. 12

Answer: B

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50. If $n \in N$ then $3.\ 5^{2n+1} + 2^{3n+1}$ is divisible by

A. a.24

B. b.64

C. c.17

D. d.676

Answer: C

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51. If n is a $+ve$ integer, $4^n - 3n - 1$ is divisible by

A. 3

B. 9

C. 8

D. 27

Answer: A

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52. The greatest positive integer, which divides $(n+1)(n+2)(n+3)(n+4)$ for all $n \in N$ is

A. 6

B. 4

C. 120

D. 24

Answer: D

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53. The sum to $n$terms of the series

$$\frac{1}{\sqrt{1}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{7}}+\ldots$$

A. a. $\sqrt{2n+1}$

B. b. $\frac{1}{2}\sqrt{2n+1}$

C. c. $\sqrt{2n+1}-1$

D. d. $\frac{1}{2}\left[\sqrt{2n+1}-1\right]$

Answer: D

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54. The sum of n terms of the series $\frac{3}{1^2} + \frac{5}{1^2+2^2} + \frac{7}{1^2+2^2+3^2} + \ldots\ldots$ is

A. a. $\frac{6n}{n+1}$

B. b. $\frac{9n}{n+1}$

C. c. $\frac{12n}{n+1}$

D. d. $\frac{3n}{n+1}$

Answer: A

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55. If n is odd then the sum of n terms of the series

$1^2 - 2^2 + 3^2 - 4^2 + 5^2 - 6^2 - \ldots\ldots\ldots$ is

A. a. $\frac{n(n+1)}{2}$

B. b. $\frac{-n(n+1)}{2}$

C. c. $\frac{n(n-1)}{2}$

D. d. $\frac{-n(n-1)}{2}$

Answer: A

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56. If $\log a + \log\left(\frac{a^2}{b}\right) + \log\left(\frac{a^3}{b^2}\right) + \ldots . n$ terms $= \frac{n}{2}(P\log a + Q\log b)$ then $PQ =$

A. a. $n^2 - 1$

B. b. $1 - n^2$

C. c. $(n+1)^2$

D. d. $(n-1)^2$

Answer: B

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57. For a natural number n which one is the correct statement?

A. a. $1^3 + 2^3 + 3^3 + ... + n^3 = (1 + 2 + 3 + ... + n)^2$

B. b. $1^3 + 2^3 + 3^3 + ... + n^3 > (1 + 2 + 3 + ... + n)^2$

C. c. $1^3 + 2^3 + 3^3 + ... + n^3 < (1 + 2 + 3 + ... + n)^2$

D. d. $1^3 + 2^3 + 3^3 + ... + n^3 \neq (1 + 2 + 3 + ... + n)^2$

Answer: A

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58. Sum of the series $1 + \frac{3^2}{2!} + \frac{3^4}{4!} + \frac{3^6}{6!} + ... \to \infty$ is

A. 1: e^{-3}

B. 2: e^3

C. 3: $\frac{e^3 - e^{-3}}{2}$

D. 4: $\frac{1}{2}\left(e^{3}+e^{-3}\right)$

Answer: D

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59. $1+\frac{1+2}{2}+\frac{1+2+3}{3}+\frac{1+2+3+4}{4}+\ldots$ to n terms =

A. 110

B. 111

C. 115

D. 116

Answer: C

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60. The sum of n terms of the series

$1^2 - 2^2 + 3^2 - 4^2 + 5^2 - 6^2 + \ldots$ is

A. $-\frac{n(n+1)}{2}$

B. $\frac{n(n+1)}{2}$

C. $-n(n+1)$

D. $n(n+1)$

Answer: A

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61. Sum of the series

$S = 1^2 - 2^2 + 3^2 - 4^2 + \ldots . - (2002)^2 + (2003)^2$ is

A. 2007006

B. 1005004

C. 2000506

D. 1005040

Answer: A

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62. If $S_n = \frac{1}{6}n(n+1)(n+2)$ is the sum to n terms of a series whose n^{th} term is T_n, then $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{1}{T}$ is

A. $\frac{n(n+1)}{2}$

B. $\frac{n(n+2)}{2}$

C. $\frac{n(n+3)}{2}$

D. $\frac{n(n+5)}{2}$

Answer: C

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63. If $S_n = \frac{1}{6}n(n+1)(n+2)$ is the sum to n terms of a series whose n^{th}term is T_n, then $\lim_{n\to\infty} \sum_{r=1}^{n} \frac{1}{T}$ is

A. a.2

B. b.3

C. c.$\frac{3}{2}$

D. d.6

Answer: A

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64. If $S_n = \frac{1}{6}n(n+1)(n+2)$ is the sum to n terms of a series whose n^{th}term is T_n, then $\lim_{n\to\infty} \sum_{r=1}^{n} \frac{1}{T}$ is

A. $\frac{1}{4}\sum(2r+1)(2r-1)(2r+3)$

B. $-\frac{1}{4}\sum(2r+1)(2r-1)(2r+3)$

C. $\sum(2r+1)(2r-1)(2r+3)$

D. $-\sum(2r+1)(2r-1)(2r+3)$

Answer: B

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65. Let S_n denote the sum of the cubes of the first n natural numbers and s_n denote the sum of the first n natural numbers. Then $\sum_{r=1}^{n}\frac{S_r}{S_r}$ equals :

A. $\sum_{r=1}^{n} r$

B. $\frac{1}{3}\sum_{r=1}^{n+1} r$

C. $\frac{n+2}{3}\sum_{r=1}^{n} r$

D. none of these

Answer: C

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66. If t_n denotes the nth term of the series :

$2 + 3 + 6 + 11 + 18 + \ldots\ldots\ldots$, then t_{50} is :

A. $49^2 - 1$

B. 49^2

C. $50^2 + 1$

D. $49^2 + 2$

Answer: D

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67. The 10th common term between the series :

$3 + 7 + 11 + \ldots\ldots$ and $1 + 6 + 11 + \ldots\ldots\ldots\ldots 1$ is :

A. 191

B. 193

C. 211

D. none of these

Answer: A

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68. If the sum of n terms of the series $2^3 + 4^3 + 6^3 + . .$ is 3528 , then n=

A. 1)6

B. 2)7

C. 3)8

D. 4)9

Answer: A

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69. $1.2 + 2.3 + 3.4 + ...$ to n terms =

A. 1) $\frac{n(n+1)(n+5)}{3}$

B. 2) $\frac{n(n+1)(n+2)}{3}$

C. 3) $\frac{4\left(4n^2+6n-1\right)}{3}$

D. 4) $n(n+1)(n+1)^2$

Answer: B

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70. The 99^{th} term of the series $2+7+14+23+34+\ldots.$

A. 1) 9999

B. 2) 9998

C. 3) 10000

D. 4) 10009

Answer: B

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71. If $3+(3+d)\frac{1}{4}+(3+2d)\frac{1}{4^2}+..,\infty$ is $\frac{44}{9}$ then$d$=

A. a)1

B. b)2

C. c)3

D. d)4

Answer: B

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72. Find the sum to n terms of the series $1^2+\left(1^2+2^2\right)+\left(1^2+2^2+3^2\right)+\ldots..$

A. $\frac{n(n+1)(n+2)}{6}$

B. $\frac{n(n+1)(n+2)}{12}$

C. $\frac{n(n+1)(n+2)}{12}$

D. $\frac{n^2(n+1)(n+2)}{6}$

Answer: B

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73. If $a_k = \frac{1}{k(k+1)} f$ or $k = 1, 2, 3, \ldots, n$, then $\left(\sum_{k=1}^{n} a_k\right)^2 =$

A. 1) $\frac{n^6}{(n+1)^6}$

B. 2) $\frac{n}{n+1}$

C. 3) $\frac{n^2}{(n+1)^2}$

D. 4) $\frac{n^4}{(n+1)^2}$

Answer: B

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74. If $2^3 + 4^3 + 6^3 + \ldots + (2n)^3 = kn^2(n+1)^2$ then k=

A. $\frac{1}{2}$

B. 1

C. $\frac{3}{2}$

D. 2

Answer: D

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75. Find the sum of integers from 1 to 100 that are divisible by 2 or 5.

A. 3000

B. 3050

C. 3600

D. 3250

Answer: B

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76. If $t_n = \frac{1}{4}(n+2)(n+3), n = 1, 2, 3, ..$ then $\frac{1}{t_1} + \frac{1}{t_2} + \frac{1}{t_3} + .. + \frac{1}{t_{2003}} =$

A. $\frac{4006}{3006}$

B. $\frac{4003}{3007}$

C. $\frac{4006}{3008}$

D. $\frac{4006}{3009}$

Answer: D

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77. $\sum_{k=1}^{5} \frac{1^3 + 2^3 + ... + k^3}{1 + 3 + 5 + ... + (2k-1)} =$

A. 1: 22.5

B. 2: 24.5

C. 3: 28.5

D. 4: 32.5

Answer: A

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78. For all integers $n \geq 1$, which of the following is divisible by 9

A. $8^n + 1$

B. $4^n - 3n - 1$

C. $3^{2n} - 3n - 1$

D. $10^n + 1$

Answer: B

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79. The sum of first n terms of the series

$1^2 + 2.2^2 + 3^2 + 2.4^2 + 5^2 + 2.6^2 + \ldots\ldots\ldots$ is $\frac{n(n+1)^2}{2}$ when n is even. When, n is odd, the sum is :

A. $\frac{n(n+1)}{2}$

B. $\frac{n^2(n+1)}{2}$

C. $\frac{n^2(n+1)}{2}$

D. $n^2\frac{(n+1)^2}{4}$

Answer: B

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80. If $S_n = \frac{1}{6.11} + \frac{1}{11.16} + \frac{1}{16.21} +$ ..... to n terms, then $6S_n$ equals

A. $\frac{5}{5n+6}$

B. $\frac{5n-4}{5n+6}$

C. $\frac{1}{5n+6}$

D. $\frac{2n-1}{5n+6}$

Answer: A

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81.

$$\frac{1}{2\cdot 5}+\frac{1}{5\cdot 8}+\frac{1}{8\cdot 11}+\ldots\ldots\ldots\frac{1}{(3n-1)(3n+2)}=\frac{n}{(6n+4)}\forall n\in N$$

A. $\frac{n}{6n+3}$

B. $\frac{n}{6n-4}$

C. $\frac{n+1}{6n+4}$

D. $\frac{n}{6n+4}$

Answer: D

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82. Sum to n terms of the series $\frac{1}{2.5}+\frac{1}{5.8}+\frac{1}{8.11}+..=$

A. $\frac{1}{6n+4}$

B. $\frac{n}{4n+6}$

C. $\frac{n}{3n+7}$

D. $\frac{n}{6n+4}$

Answer: D

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83. If n is a positive integer, then n^3+2n is divisible

A. 15

B. 3

C. 2

D. 6

Answer: B

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84. The number $\left(49^2-4\right)\left(49^3-49\right)$ is divisible by

A. $5!$

B. $6!$

C. $7!$

D. 8!

Answer: A

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85. The sum of 1^{st} n terms of the series

$$\frac{1^2}{1}+\frac{1^2+2^2}{1+2}+\frac{1^2+2^2+3^2}{1+2+3}+..$$

A. $\frac{n^2 - 2n}{3}$

B. $\frac{2n^2 - n}{3}$

C. $\frac{n(n+2)}{3}$

D. $\frac{2n^2 - n}{3}$

Answer: C

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86. $1 + 3 + 5 + 7 + .. + 29 + 30 + 31 + 32 + .. + 60 =$

A. 1611

B. 1620

C. 1609

D. 1600

Answer: B

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87. The sum of n terms of the series $1+(1+3)+(1+3+5)+\ldots\ldots$ is

A. 1) n^2

B. 2) $\left[\frac{n(n+1)}{2}\right]^2$

C. 3) $\frac{n(n+1)(2n+1)}{6}$

D. 4)none of these

Answer: C

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88. $1+\frac{3}{2}+\frac{5}{2^2}+\frac{7}{2^3}+\ldots. \to \infty =$

A. $\frac{16}{35}$

B. $\frac{11}{8}$

C. $\frac{35}{16}$

D. $\frac{8}{6}$

Answer: C

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89. $\sum_{i=1}^{n}\sum_{j=1}^{i}\sum_{k=1}^{j} 1$ equals :

A. $\sum n$

B. $\sum n^2$

C. $\sum n^3$

D. none of these

Answer: D

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90. The $\sum 1^2+1+2^2+2+3^2+3+..+n^2+n$ is

A. $\frac{n(n+1)}{2}$

B. $\left[\frac{n(n+1)}{2}\right]^2$

C. $\frac{n(n+1)(n+2)}{3}$

D. $\frac{n(n+1)(n+2)(n+3)}{4}$

Answer: C

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91. The sum to infinity of the series :

$1+\frac{2}{3}+\frac{6}{3^2}+\frac{10}{3^3}+\frac{14}{3^4}+\ldots\ldots\ldots$ is :

A. 6

B. 2

C. 3

D. 4

Answer: C

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