Ravi Maths Tuition

Sequences and Series

11th Standard

Mathematics

Multiple Choice Question 57 x 1 = 57

1) If first and last terms ofanAP. are 3 and 18 and the sum of its terms is 84, then number of terms will be _____.

(a) 5 (b) 6 (c) 7 (d) 8

2) If the sum of n terms of an AP. is $4n^2 + 7n$, then its nth term is _____.

(a) 8n -3 (b) 8n + 3 (c) 3n - 8 (d) None of these

3) If Sn denote the sum of n terms of an AP. whose first term is a and common difference is d given by is d given by $d = S_n - kS_{n-1} + S_{n-2}$ then K is equal to _____.

(a) 5 (b) 2 (c) 3 (d) 4

4) If the first, 'second and last term of an AP. are a, band 2a respectively then its sum is equal to _____.

(a) $\frac{b}{2(b-a)}$ (b) $\frac{a}{3(b-a)}$ (c) $\frac{3ab}{2(b-a)}$ (d) $\frac{2ab}{3(b-a)}$

5) If the first term of an AP. is 5 and common difference is - 3 then sum of its 60 terms is equal to _____.

(a) -1050 (b) -5010 (c) 3010 (d) None of these

6) If a, b, c are in G.P. and $a^{\frac{1}{x}} = b^{\frac{1}{y}} = c^{\frac{1}{z}}$, then xyz are in _____.

(a) A.P (b) G.P (c) None of these

7) The three geometric means between the numbers 1 and 81 are _____.

(a) 3, 6 and 18 (b) 3, 9 and 27 (c) 3, 6 and 27 (d) None of these

8) In a G.P. if the $(m + n)^{th}$ terms is p and $(m - n)^{th}$ terms is q then its mth terms is _____.

(a) -1 (b) pq (c) $\sqrt{pq}$ (d) $\frac{1}{2}(p+q)$

9) If the sum of first n even natural numbers is equal to m times the sum of first n is odd natural numbers then m is equal to _____.

(a) $\frac{n-1}{n}$ (b) $\frac{n+1}{n}$ (c) $\frac{2n+1}{n}$ (d) None of these

10) Sum of n terms of ,the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + ...$ is _____.

(a) $\left[\frac{n(n+1)}{2}\right]^2$ (b) n^2 (n+3) (c) $\frac{n(n+1)}{\sqrt{2}}$ (d) 2

11) The sum to infinity of $\frac{1}{3} + \frac{3}{9} + \frac{5}{27} + \frac{7}{81} + \ldots + \infty$ is _____.

(a) 2 (b) 1 (c) 0 (d) 3

12) The sum of the square of (n - 1) natural numbers is _____.

(a) $\frac{n(n+1)(2n+1)}{6}$ (b) $\frac{n(n-1)(2n-1)}{6}$ (c) $\frac{(n+1)(n-1)(n-2)}{6}$ (d) None

13) The seen to infinity of the series $1 + 2.\frac{1}{2} + 3.\frac{1}{2^2} + 4.\frac{1}{2^3} + \ldots + \infty$ _____.

(a) 4 (b) 5 (c) 1 (d) None

14) The sum of infinity of the G.P. a, ar, ar^2, ar^3, ... ∞ is _____.

(a) $\frac{a-1}{1-r}$ (b) $\frac{a}{1-r}$ (c) $\frac{2a}{1-r}$ (d) $\frac{a}{1-r^2}$

15) The sum of first n natural numbers, is _____.

(a) $\frac{n(n+1)(2n+1)}{6}$ (b) $\frac{n(n+1)}{2}$ (c) $\left[\frac{n(n+1)}{2}\right]^2$ (d) $\frac{n(n+1)(n+2)(n+3)}{6}$

16) The sum of their squares, is _____.

(a) $\frac{n(n+1)(2n+1)}{6}$ (b) $\frac{n(n+1)}{2}$ (c) $\left[\frac{n(n+1)}{2}\right]^2$ (d) $\frac{n(n+1)(n+2)(n+3)}{6}$

17) The sum of their cubes, is _____.

(a) $\frac{n(n+1)(2n+1)}{6}$ (b) $\frac{n(n+1)}{2}$ (c) $\left[\frac{n(n+1)}{2}\right]^2$ (d) $\frac{n(n+1)(n+2)(n+3)}{6}$

18) If n^{th} term is $n^2 + 2^n$, then the sum of first n terms of the series is _____.

(a) $\frac{n(n+1)(2n+1)+2(2^n-1)}{6}$ (b) $\frac{n(n+1)(2n+1)}{6} + 2\left(1-2^n\right)$ (c) $\frac{n(n+1)(2n+1)}{6} + 2\left(2^n-1\right)$ (d) $\frac{n(n+1)(2n+1)+2(1-2^n)}{6}$

19) If the sum of first n natural numbers is $\frac{1}{5}$ times the sum of their squares, then the value of n is _____.

(a) 5 (b) 6 (c) 7 (d) 8

20) A sequence is called ...A... sequence, if it is not a finite sequence. Here, A refers to _____.

(a) bounded (b) limited (c) infinite (d) None of these

21) The sequence 3,3.3, 3.33, 3.333, 3.3333, is a/an ...A... sequence, since it ...B.. ends. Here, A and B refer to _____.

(a) finite, never (b) infinite, never (c) finite, always (d) infinite, always

22) The nth term a_n of a sequence can also be denoted as _____.

(a) n(a) (b) a(n) (c) (n)(a) (d) None of these

23) The series $a_1 + a_2 + a_3 + \ldots a_n$ is abbreviated as ... _____.

(a) $\sum_{k=1}^{n} a_k$ (b) $\prod_{k=1}^{n} a_k$ (c) $\sum_{k=1}^{n} a_n$ (d) $\prod_{k=1}^{n} a_n$

24) The general term of a GP,whose first non-zero term is a and common ratio is r, can be written as _____.

(a) $a_n = ar^n$ (b) $a_{n+1} = ar^{n+1}$ (c) $a_n = ar^{n-1}$ (d) $a_n = ar^{n+1}$

25) If the numbers $\frac{-2}{7}, x, \frac{-7}{2}$ are in GP,then the values of x are _____.

(a) ±1 (b) 1,2 (c) -1.2 (d) ± 2

26) If the products of the corresponding terms of the sequences a, ar, ar^2, ... , ar^{n-1} and A, AR, AR^2.... , AR^{n-1} form a GP,then the common ratio is ...Y.... Here, Y refers to _____.

(a) r / R (b) rR (c) R (d) r

27) If a, b, c are in arithmetic progression, then the value of (a + 2b - c) (2b+ c - a) (a + 2b + c) is _____.

(a) 16abc (b) 4abc (c) 8abc (d) 3abc

28) The collection of objects listed in a sequence is _____.

(a) random (b) ordered (c) random or ordered (d) None of these

29) The general term of the sequence is denoted by _____.

(a) a_n (b) a^n (c) n (d) n.a

30) Asequence may be defined as a _____.

(a) relation, whose range $\subseteq$ N(natural number) (b) function whose range $\subseteq$ N

(c) function whose domain $\subseteq$N (d) progression having real values

31) The series is finite or infinite according as the given sequence is.....

(a) infinite (b) finite (c) finite or infinite (d) infinite or finite

32) Series are often represented in compact form, called _____.

(a) beta notation (b) nano notation (c) sigma notation (d) neu notation

33) A sequence a_1 a_2, a_3, ,a_n,.... is called arithmetic sequence or arithmetic progression, if _____.

(a) $a_{n+1} = a_{n-1} + d$, $n \in N$, where a_1, d are first term and common differenece respectively

(b) $a_{n-1} = a_{n+1} + d$, $n \in N$, where a_1., d are first term and common term respectively

(c) $a_{n+1} = a_n + d$, $n \in N$, where a_1, d are first term and common differenece respectively

(d) $a_{n+1} = an + d$, $n \in N$, where a_1, d are first term and common term respectively

34) If the first term is a and the common difference is d, then the arithmetic progression is _____.

(a) a + d, a + 2d.,a + 3d,..... (b) a, a + d, a + 2d.,a + 3d,... (c) a-d, a- 2d.,a -3d,.....

(d) a, a -d, a- 2d.,a -3d,..

35) If the first term is a and common difference is d, then the n^{th} term (general term) of A.P. is _____.

(a) $a_n = a+ (n -1)d$ (b) $a_n = a+ (n + 1)d$ (c) $a_n = a + nd$ (d) $a_n = a - nd$

36) Which of the following is incorrect?

(a) If a constant is added to each term of an A.P.,the resulting sequence is also an A.P.

(b) If a constant is subtracted'from each term of an A.P.,the resulting sequence is also an A.P.

(c) If each term of an A.P. is multiplied by a constant, then the resulting sequence is also an A.P.

(d) If each term of an A.P. is divided by a constant, then the resulting sequence is also an A.P.

37) A man starts repaying a loan as first instalment of Rs100. If he increases the instalment by Rs 5 every month, then the amount he will pay in the 30^{th} instalment is _____.

(a) Rs.241 (b) Rs.250 (c) Rs.245 (d) Rs.265

38) Let an AP a , a + d, a +2d,..., I has n terms, then $S_n = \frac{n}{2}[2a + (n-1)d]$ can also be written as _____.

(a) $S_n = \frac{n}{2}[a - l]$ (b) $S_n = n[a + l]$ (c) $S_n = \frac{n}{2}[a + l]$ (d) $S_n = n[a - l]$

39) The income of a person is Rs 300000 in the first year and he receives an increase of Rs 10000 to his income per year for the next 19 yr. Then, the total amount he received in 20 yr, is _____.

(a) 7900000 (b) 6000000 (c) 8000000 (d) 6900000

40) If A is the arithmetic mean of the numbers a and b, then _____.

(a) A, a, b, are in AP (b) a, A, b, are in AP (c) A, b, a, are in AP (d) None of these

41) If A is the arithmetic mean of the numbers a and b, then which of the following is not correct?

(a) $A = \frac{a+b}{2}$ (b) $A - a = b - A$ (c) $a - A = A - b$ (d) $A = \frac{a-b}{2}$

42) If x and yare inserted between 4 and 16, so that the resulting sequence becomes an AP, then _____.

(a) x=8, y=12 (b) x=10, y=12 (c) x=8, y=10 (d) x=10, y=14

43) If every term in a progression except the first term bears a constant ratio to the term immediately preceding it, then such progression is called _____.

(a) arithmetic progression (b) geometric progression (c) harmonic progression

(d) None of the above

44) If a, ar, ar^2, ar^3 , ... is a geometric progression, then a and r are respectively called _____.

(a) common ratio, first term (b) common difference, first term (c) first term, common difference

(d) first term, common ratio

45) Which of the following is not a geometric sequence?

(a) 2, 4, 8, 16..... (b) $\frac{1}{9}, \frac{-1}{27}, \frac{1}{81}, \frac{-1}{243}$.... (c) 0.01,.0001, .000001, ... (d) None of these

46) Which of the following is correct?

(a) a, ar, ar^2, ar^3,..... , $ar^{n-1}$is a finite G.P (b) a, r, r^2, r^3,... , r^{n-1}..., is a finite G.P

(c) $a + ar + ar^2 + ...+ ar^{n-1}$ is a finite G.P (d) $a + r + r^2 +... + r^{n-1}$ + is a finite G.P.

47) The n^{th} term of a G.P. 5, 25, 125, ... is _____.

(a) 5^n (b) 5^{n-1} (c) 5^{n+1} (d) 5^{n-2}

48) Let a, ar, ar^2, ar^3, ...ar^{n-1}be a GP, then _____.

(a) $S_n = na, r \neq 1$ (b) $S_n = \frac{a(r^n-1)}{r-1}, r \neq 1$ (c) $S_n = \frac{r-1}{a(r^n-1)}, r \neq 1$ (d) $S_n = \frac{a(r^n+1)}{r-1}, r \neq 1$

49) The value of $\sum_{k=1}^{10} \left(1 + 2^k\right)$ is _____.

(a) 2085 (b) 2805 (c) 2056 (d) 2508

50) A person has 2 parents, 4 grandparents, 8 great grandparents and so on. Then, the number of ancestors during the ten generations preceding his own is _____.

(a) 1084 (b) 2046 (c) 2250 (d) 1024

51) In a GP of even number of terms, then the sum of all terms is 5 times the sum of the odd terms. The common ratio of the GP is _____.

(a) $-\frac{4}{5}$ (b) $\frac{1}{5}$ (c) 4 (d) None of these

52) Sum of infinite terms of the sequence a, ar, ar^2, ... is equal to _____.

(a) $\frac{a}{1-r}, r \neq 1$ (b) $\frac{a}{1+r}, r \neq -1$ (c) $\frac{1}{1+r}, r \neq -1$ (d) None of these

53) The geometric mean of two positive numbers a and b is _____.

(a) $\frac{a+b}{2}$ (b) $\frac{a-b}{2}$ (c) $\sqrt{ab}$ (d) ab

54) The geometric mean of 2 and 8 is _____.

(a) 4 (b) 6 (c) 7 (d) 5

55) The numbers which can be inserted between two positive numbers a and b to make the resulting sequence in a G.P.,are _____.

(a) three (b) four (c) many (d) infinitely many

56) If A and G are AM and GM of two given positive real numbers a and b respectively, then A and G are related as _____.

(a) $A \geq G$ (b) $G \leq A$ (c) A = G (d) A = -G

57) If A and G be the AM and GM between two positive numbers, then two positive numbers a and b are respectively _____.

(a) $A + \sqrt{A^2 - G^2}$ and $A - \sqrt{A^2 - G^2}$ (b) $A - \sqrt{A^2 - G^2}$ and $A + \sqrt{A^2 - G^2}$

(c) $A + \sqrt{A^2 + G^2}$ and $A + \sqrt{A^2 + G^2}$ (d) None of the above

2 Marks 340 x 2 = 680

58) Write the first five terms of each of the following sequence whose nth terms are $a_n = \frac{n}{n+1}$

59) Find the indicated terms in each of the sequence, where nth terms are given.
$a_n = \frac{n^2}{2^n}$, a_7

60) Write the first five terms of each of the sequence and obtain the corresponding series. $a_1 = 3$, $a_n = 3a_{n-1}+2$, for all $n > 1$

61) Write the first five terms of each of the sequence and obtain the corresponding series. $a_1 = a_2 = 2$, $a_n = a_{n-1} - 1$, $n > 2$

62) Write the first five terms of each of the sequence and obtain the corresponding series.
$a_1 = -1$, $a_n = \frac{a_{n-1}}{n}$, $n \geq 2$

63) If a, b, c, d are in G.P, prove that $(a^n + b^n)$, $(b^n + c^n)$, $(c^n + d^n)$ are in G.P.

64) A G.P. consists of an even number of terms. If the sum of all the terms is 5 times the sum of terms occupying odd places, then find its common ratio.

65) Find the sum of the products of the corresponding terms of the sequences 2, 4, 8, 16, 32 and 128, 32, 8, 2, $\frac{1}{2}$.

66) The sum of first three terms of a G.P. is 16 and the sum of the next three terms is 128. Determine the first term, the common ratio and the sum to n terms of the G.P.

67) Let S be the sum, P be the product and R be the sum of reciprocals of n terms in a GP. Prove that $P^2R^n=S^n$.

68) Shamshad Ali buys a scooter for Rs 22000. He pays Rs 4000 cash and agrees to pay the balance in annual instalment of Rs 1000 plus 10% interest on the unpaid amount. How much will the scooter cost him?

69) If A and G be AM and GM respectively between two positive numbers, then prove that the numbers are $A \pm \sqrt{(A+G)(A-G)}$

70) The sum of some terms of GP is 315, whose first term and common ratio are 5 and 2, respectively.Find the last term and number of terms.

71) The number of bacteria in a certain culture doubles every hour. If there were 30 bacteria present in the culture originally, how many bacteria will be present at the end of 2^{nd} hour, 4^{th} hour and n^{th} hour ?

72) Find the 12th term of a GP whose 8 th term is 192 and the common ratio is 12.

73) Given a G.P. with a = 729 and 7^{th} term 64, determine S_7 .

74) Show that the ratio of the sum of first n terms of a G.P. to the sum of terms from $(n+1)^{th}$ to $(2n)^{th}$ term is $\frac{1}{r^n}$.

75) The 4^{th} term of a G.P. is square of its second term, and the first term is – 3. Determine its 7^{th} term.

76) Find four numbers forming a geometric progression in which the third term is greater than the first term by 9, and the second term is greater than the 4^{th} by 18.

77) If a, b, c and d are in G.P. show that $(a^2 + b^2 + c^2)(b^2 + c^2 + d^2) = (ab + bc + cd)^2$

78) Insert two numbers between 3 and 81 so that the resulting sequence is G.P.

79) If the 4^{th}, 10^{th} and 16^{th} terms of a G.P. are x, y and z, respectively. Prove that x, y, z are in G.P.

80) Write the first five terms of each of the following sequence whose nth terms are: $a_n = n(n+2)$

81) Write the first five terms of each of the following sequence whose nth terms are: $a_n = 2^n$

82) Write the first five terms of each of the following sequence whose n^{th} terms are: $a_n = \frac{2n-3}{6}$

83) Write the first five terms of each of the following sequence whose n^{th} terms are: $a_n =(-1)^{n-1} .5^{n+1}$

84) Write the first five terms of each of the following sequence whose n^{th} terms are: $a_n = n\frac{n^2+5}{4}$

85) Find the indicated terms in each of the sequence, where nth terms are: $a_n=4n-3; a_{17}, a_{24}$

86) Find the indicated terms in each of the sequence, where nth terms are: $a_n =(-1)^{n-1}n^3; a_9$

87) Find the indicated terms in each of the sequence, where nth terms are: $a_n = \frac{n(n-2)}{n+3}; a_{20}$

88) Show that the products of the corresponding terms of the sequences a, ar, ar^2..ar^{n-1} and A,AR,AR^2,... AR^{n-1} form a G.P, and find the common ratio.

89) What will Rs 500 amounts to in 10 years after its deposit in a bank which pays annual interest rate of 10% compounded annually?

90) If A.M. and G.M. of roots of a quadratic equation are 8 and 5, respectively, then obtain the quadratic equation.

91) For what values of x, the numbers $\frac{-2}{7}, x, \frac{-7}{2}$ are in G.P.?

92) Find the sum to indicated number of terms in each of the geometric progressions in Exercises : 1, -a, $-a^2$, $-a^3$ ... n terms (if a $\neq$- 1).

93) Find the sum to indicated number of terms in each of the geometric progressions in Exercises : x^3, :x^5, x^7, ... n terms (if x $\neq \pm$ 1).

94) The 5^{th}, 8^{th} and 11^{th} terms of a G.P. are p, q and s, respectively. Show that q^2 = ps.

95) Find the sum to indicated number of terms in each of the geometric progressions in Exercises : 0.15, 0.015, 0.0015, ... 20 terms.

96) Find the sum to indicated number of terms in each of the geometric progressions in Exercises : $\sqrt{7}, \sqrt{21}, 3\sqrt{7},$ .....n terms.

97) Evaluate $\sum_{k=1}^{11} \left(2 + 3^k\right)$

98) How many terms of G.P. 3, 3^2, 3^3, ...are needed to give the sum 120?

99) A man deposited Rs 10000 in a bank at the rate of 5% simple interest annually. Find the amount in 15^{th} year since he deposited the amount and also calculate the total amount after 20 years.

100) Find the 20^{th} term of the series 2 x 4 + 4 x 6 + 6 x 8 + ... + n terms.

101) Write the first three terms in each of the following sequences defined by the following:
(i) $a_n = 2n + 5$
(ii) $a_n = \frac{n-3}{4}$

102) What is the 20th term of the sequence defined by
a_n = (n – 1) (2 – n) (3 + n) ?

103) Let the sequence an be defined as follows:
a_1 = 1, $a_n = a_{n-1} + 2$ for n $\geq$ 2.
Find first five terms and write corresponding series

104) Find the 10^{th} and n^{th} terms of the G.P. 5, 25,125,...

105) Which term of the G.P., 2,8,32, ... up to n terms is 131072?

106) Find the 20th term a_{20} of the sequence, whose nth term is
$a_n = \frac{n(n-2)}{n+3}$

107) Write first five terms of sequence
(i) $a_n = (-1)^{n-1} 5^{n+1}$

108) Write first five terms of sequence
(ii) $a_n = 2n^2 - n + 1$

109) Let the sequence a_n is defined as follows a_1=2, $a_n = a_{n-1}+3$ for n$\geq$ 2.Find first five terms and write corresponding series.

110) Write the first five terms of each of the following sequence whose nth terms are
$a_n = (-1)^{n+1} 3^{n+2}$

111) Write the first five terms of each of the following sequence whose nth terms are
$b_n = \frac{n(n^2+5)}{4}$

112) Write the first five terms of each of the following sequence whose nth terms are
$a_n = \frac{n^3+1}{2}$

113) Write the first five terms of each of the following sequence whose nth terms are
a_1 =1, $a_n = a_{n-1}+3$ for n $\geq$ 2

114) Find the indicated terms in each of the sequence, where nth terms are given.
$a_n = 5n - 3$, a_{12}, a_{15}

115) Find the indicated terms in each of the sequence, where nth terms are given.
(i) $b_n = (-1)^n(n^2 - 1)$, b_7, b_{13}
(ii) $a_n = \frac{n^2}{2^n}, a_7$

116) Write the first five terms of each of the sequence and obtain the corresponding series.
$a_n = \frac{1}{6}(2n - 3)$

117) Write the first five terms of each of the sequence and obtain the corresponding series.
$a_n = (-1)^{n^2}\left(\frac{2^{n^2}+3}{2}\right)$

118) Show that the sequence a_n defined by $a_n = 2n^2 + 1$, is not an AP.

119) The nth term of a sequence is 3n - 2. Is the sequence an AP ? If it is an AP, then find its 6th term.

120) Write down the next term of the sequence $\frac{1}{6}, \frac{1}{3}, \frac{1}{2}, \ldots$.

121) Find the rth term of an AP, sum of whose first n terms is. $2n + 3n^2$

122) Find the sum of the series 45 + 47 + 49 + ...+ 99.

123) Find the sum of 20 terms of an AP, whose first term is 3 and last term is 57.

124) If $\theta_1, \theta_2, \theta_3, \ldots\ldots\theta_n$ are in AP whose common difference is d, show that $\sec\theta_1 \sec\theta_2 + \sec\theta_2 \sec\theta_3 + \ldots + \sec\theta_{n-1} \sec\theta_n = \frac{\tan\theta_n - \tan\theta_1}{\sin d}$

125) If the sum of first n terms of a progession is a quadratic expression in m, then show that it is an AP.

126) Find the indicated term of given AP.
a = 3, d = 2; T_n, T_{10}

127) If the Sum of n terms of an AP is given by $s_n = 3n + 2n^2$, then find the common difference of the AP.

128) Find the sum of 24 terms of an AP 1,3,5,7,.....

129) Find the sum of 10 terms of an AP $4, 5\frac{1}{3}, 4\frac{2}{3}$

130) Is 667 a term of an AP 11, 18, 25,.....?

131) Find the sum of indicated number of terms in the following AP.
x + y, x - y, x-3y,...,22 terms

132) How many terms are there in AP 20, 25, 30,....., 100 ?

133) Find the sum of 20 terms of the sequence $\sqrt{2}, 2\sqrt{2}, 3\sqrt{2}, \ldots\ldots$

134) Find the sum of 100 terms of the series 0.7+0.71+0.72+.....

135) Find the sum of -0.5, -1.0, -1.5,.....upto 10 terms.

136) Find the value of x, when 1+6+11+....+x = 148.

137) Determine the sum of first 35 terms of an AP, if its second term is 2 and seventh term is 22.

138) Which term of the sequence 72, 70, 68, 66,....is 40 ?

139) Find the Sum of odd integers from 1 to 2001.

140) Find the Arithmetic mean between
(a-b) and (a+b)

141) Find the Arithmetic mean between
12 and 22

142) Insert five numbers between 8 and 26 such that the resulting sequence is an AP.

143) Insert the three numbers between between 3 and 19 such that the resulting sequence is an AP.

144) The 10th term of an AP is 41 and 18th term is 73. Find AP.

145) If the first term of an AP is a and the sum of the first p terms is zero, then find the sum of its next q terms.

146) The Sum of first 7 terms of an AP is 10 and that of next 7 terms is 7 terms is 17. Find the AP.

147) Find the Sum of first 20 terms of an AP, n whichg 3rd terms is 7 and 7th term is two more than thrice of its 3rd term.

148) FInd the Sum of all natural numbers between 250 and 1000 which are exactly divisible by 3.

149) Finsd the sum of all two digit numbers which when divided by 4, yield 1 as reminder.

150) Find the sum of all natural numbers lying betrween 100 and 1000,which arte multiples of 5.

151) Which term of the sequence 20, $19\frac{1}{4}$, $18\frac{1}{2}$, $17\frac{3}{4}$,..... is the first negative term ?

152) Find the sum to n terms of the sequence loga,logar,logar^2.....

153) How many three digit numbers are divisible by 7 ?

154) If the sum of n terms of an AP is $3n^2+5n$ and its mth term is 164, find the value of m.

155) In an AP, the pth term is q and the (p+q)th term is 0.Then , find the qth term.

156) the income of a person is 300000, in the first year and he receives an case of 10000 his income per year for the next 19years .Find the total amount,he received in 20 years.

157) On the first day strike of physicians in a hospital, the attendance of the OPD was 1500 patients. As the strike continued, the attendance declined by 100 patients every day . Find from which day of the strike ,the OPD would would have no patient?

158) The gate receipts at the show of ' Comedy Nights ' 9500 on the first night and showed a drop of every succeeding night. If the operational expenses of the show are 2000 a day , then find on which night, the show ceases to be a profitable?

159) A Carpenter was hired to build 192 window frames. The first day he made five frames. The first day he made fivew frames and each day, thereafter he made two more frames than he made tye day before . How many days did it take him to finish the job?

160) In the arithmetic progressions 2, 5, 8,....upto 50 terms and 3, 5, 7, 9,.... upto 60 terms, find how many terms are identical.

161) If the mth term of a given AP is n and its nth term is m, then show that its pth term is (n + m -p).

162) Find the sum of the following sequences
$\frac{1}{3}$, $\frac{3}{2}$, $\frac{9}{2}$,... upto 10 terms

163) Find the sum of all numbers between 200 and 400 which are divisible by 7.

164) If the mth term of an AP be $1/n$ and its nth term be $1/m$, then show that its mnth term is 1.

165) Find the sum of following sequences
$2, -\frac{1}{2}, \frac{1}{8}$,...,upto 12 terms.

166) If the first term of an AP is 100 and the sum of first six terms is five times the sum of the next six terms, then find the common difference.

167) Find the sum of the series 2+6+18+54+...+4374

168) How many terms in the AP-9,-6,-3,... must be added together so that the sum may be 66?

169) The pth, qth and rth terms of an AP are a, b, c, respectively. Show that (q -r)a + (r - p)b + (p - q)c = 0.

170) The Sequence N of natural numbers is divided into classes as follows

1 2

3 4 5 6

7 8 9 10 11 12

.....

.....

Show that the sum of the number in nth row is n ($2n^2 + 1$).

171) If a^2, b^2, ab + bc and $b^2 + C^2$ are in GP, the prove that a, b, c are also in GP.

172) Find the 6th term from the end of the sequence 9 , 12, 15,...., 20th term.

173) Find the sum to ne terms of the sequence given by $a_n = 2^n + 3n, n \in N$.

174) Determine the number of terms in the AP 3, 7, 11,.....407. Also, find the 18th term from the end.

175) Find the number of terms of the sequence 54,51,48,..., when there sum is 513.

176) The sum of three consecutive terms of an AP is 15 and their product is 105. Find the numbers.

177) Find the 20th term of the series;

2 x 4 + 4 x 6 + 6 x 8 + ... + n terms

178) Find the sum of series

$\frac{3}{5} + \frac{4}{5^2} + \frac{3}{5^3} + \frac{4}{5^4} + \ldots$ to 2n terms.

179) How many terms of the AP -6, -11/2, -5 .... are needed to give sum -25?

180) The product of three numbers in AP is 224, and the largest number is 7 times the smallest. Find the numbers.

181) If a$\left(\frac{1}{b} + \frac{1}{c}\right)$, b$\left(\frac{1}{c} + \frac{1}{a}\right)$, c$\left(\frac{1}{a} + \frac{1}{b}\right)$ are in AP, prove that a, b, c are in AP.

182) Show that each of the following sequence is an AP. And also write three more terms in each case.

-1, $\frac{1}{4}$, $\frac{3}{2}$, $\frac{11}{4}$

183) If $S_n$denotes the sum of n terms of an AP and $S_1 = 6$ and $S = 105$, then show that $S_n : S_{n-3} = (n + 3) : (n - 3)$.

184) Show that each of the following sequence is an AP. And also write three more terms in each case.

$\sqrt{2}$, $3\sqrt{2}$, $5\sqrt{2}$, $7\sqrt{2}$, ...

185) Find the 23rd term of the sequence 7, 5, 3, 1,.....

186) Find the nth term of the sequence 8, 3, -2, -7,.....

187) Which term of the sequence

5, 8, 11, 14,....is 320.

188) Which term of the sequence

84, 80, 76, ... is 0 ?

189) Prove that the product of n GMs between any two positive numbers is equal to nth power of the GM between them.

190) Is 68 a term of the AP 7, 10, 13, ... ?

191) The first term of an AP is a, the second term is b and the last term is c. Show that the sum of the AP is $\frac{(b+c-2a)(c+a)}{2(b-a)}$

192) Is 302 a term of the AP 3, 8, 13, ... ?

193) How many terms atr there in the AP -1, $-\frac{5}{6}$, - $\frac{2}{3}$, - $\frac{1}{2}$,..... $\frac{10}{3}$?

194) The first term of an AP is 5, the common difference is 3 and the last term is 80, find the number of terms.

195) The 6th and 17th terms of an AP are 19 and 41 respectively, find the 40th term.

196) If 9 times the 9th term of an AP is equal to 13 times the 13th term, then find the 22nd term of the AP.

197) The nth term of a sequence is given by $a_n = 2n + 7$. Show that it is an AP. Also, find its 8th term,

198) The 5th and 13th terms of an AP are 5 and -3 respectively. Find the AP and obtain its 16th term.

199) If arithmetic mean and geometric mean between two numbers is 5 and 4 respectively, then find the two numbers.

200) The p th term of an AP is a and q th term is b. Prove that sum of its (p+q) th term is $\frac{p+q}{2}\left[a+b+\frac{a-b}{p-q}\right]$.

201) If the 9th term of an AP is 0, prove that its 29th term is double the 19th term.

202) If 7 times the 7th term of an AP is equal to 11 times its 11th term , show that its 18th term is 0.

203) Which term of the progression 19, $18\frac{1}{5}$, $17\frac{2}{5}$, ...is negative term ?

204) If S_1,S_2 and S_3 be respectively the sum of n,2n and 3n terms of a GP, prove that $S_1(S_3-S_2)=(S_2-S_1)^2$.

205) The interior angles of polygon are in AP. The smallest angle is 120^0 and the common difference is 5^0.Find the number of sides of polygon.

206) Find AM between 16 and 20.

207) In the ratio between the sums of n terms of two arithmetic progressions is (7n+1): (4n+27), find the ratio of their 11 th terms.

208) Find two positive numbers whose difference is 12 and whose Am exceeds the GM by 2.

209) Find the minimum value of $4^x + 4^{1-x}$, $x \in R$.

210) A man arranges to pay off a debt of Rs.3600 by 40 annual installments, which are in AP when 30 of the installments are paid, he dies leaving one-third of the debt unpaid. Find the 8th installment.

211) Find the sum of an infinite GP.Prove that $P^2R^n=S^n$.
$1, \frac{1}{3}, \frac{1}{9}, \ldots \infty$

212) Insert 6 arithmetic means between 3 and 24.

213) Prove that the sum of n arithmetic means between two numbers is n timesthe single AM between them.

214) If $b=a+a^2+a^3+\ldots\infty$, then prove that $a = \frac{b}{1+b}$

215) If a,b and c be positive numbers, then prove that $a^2 + b^2 + c^2$ is greater than ab + bc + ca.

216) Find the sum of the series
$9^{1/3},9^{1/9},9^{1/27},\ldots\infty$

217) (i) If a, b, c, d are four distinct positive quantities in AP, then show that bc > ad.

218) A man accepts a position with an initial salary of Rs.5200 per month. It is understood that he will receive an automatic increase of Rs.320 in the very next month and each month thereafter.
Find his salary for the tenth month.

219) A man accepts a position with an initial salary of Rs.5200 per month. It is understood that he will receive an automatic increase of Rs.320 in the very next month and each month thereafter.
What is his total earnings during the first year?

220) If the AM between pth and qth terms of an AP be equal to the AM between rth and sth terms of the AP, then show that p + q = r + s

221) If $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$ is AM between a and b , then find the value of n.

222) If $|x| < 1$ and $|y| < 1$, find the sum of infinity of the following series:
$(x+y) + (x^2+xy+y^2) + (x^3+x^2y+xy^2+y^3) + \ldots$

223) (ii) If a, b, c, d are four distinct positive quantities in GP then show that a + d > b + c.

224) Suppose x and y are two real numbers such that the rth mean between x and 2y is equal to rth mean between 2 x and y when n arithmetic means are inserted between them in both the cases. Show that $\frac{n+1}{r} - \frac{y}{x} = 1$

225) How many terms of GP3, $\frac{3}{2}$, $\frac{3}{4}$,...are needed to give the sum $\frac{3069}{512}$?

226) Find the least value of n for which the sum $1+3+3^2+...$to n terms is greater than 7000.

227) The digit of a three digit number are are in AP and their sum is 21. The number obtained by reversing the digit is 396 less than the original number.Find the number.

228) The sum of an infinite GP is 57 and the sum of their cubes is 9747,Find the GP.

229) Find the sum of n terms of the series whose nth term is given
n (n + 1) (n + 4)

230) Find the sum of n terms of the series whose nth term is given
$n^2 + 2^n$

231) Three numbers whose sum is 15 are in A.P. If 1, 4, 19 be added to them respectively, then they are in GP. Find the numbers.

232) Find the sum upto n terms of the series 3 + 7 + 13 + 21 + 31 + ...

233) Write the rational number correponding to the decimal expansion $0.\bar{3}56$

234) Which term of the following sequences
$\sqrt{3}$,3,$3\sqrt{3}$,.....is 729?

235) Which term of the following sequences
$\frac{1}{3}$, $\frac{1}{9}$, $\frac{1}{27}$..... is $\frac{1}{19683}$

236) For what value of x are the numbers (x + 9), (x - 6) and 4 are is GP?

237) Show that the following progression is a GP.Also , find the common ratio in each case.
4, -2, 1, -1, -1/2

238) Show that the following progression is a GP. Also , find the common ratio in each case.
a, $\frac{3a^2}{4}$, $\frac{9a^3}{16}$,.....

239) Find the term of the following GP.
(i) 11th term of the GP 3,6,12,24,.....

240) Find the term of the following GP.
(ii) 10th term of the GP 12, 4, $\frac{4}{3}$, $\frac{4}{9}$

241) Find the term of the following GP.
(iii) 17th term of the GP $2,2\sqrt{2},4,8\sqrt{2}$,...

242) Find the term of the following GP.
(iv) 8th term of the GP 0.3,0.06,0.012,.....

243) Find the term of the following GP.
(v) 12 th term of the GP $\frac{1}{ax^3}$, ax, a^5x^5, ...

244) Find the sum upto n term of the series $1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) +.....$

245) Find the sum to n terms of the following series. 1 + 5 + 12 + 22 + 35 +.....

246) If reciprocals of $\frac{x+y}{2}$,y, $\frac{y+z}{2}$ are in AP. show that x, y, z in GP.

247) Find the nth term of the series 1 + 2 + 4 + 7 +.....

248) Find the 10th term of the GP 5+25+125+..... Also , find its nth term.

249) Find 12t term of an GP , whose 8th term is 192 and common ratio is 2.

250) Find the term of the following GP.
6th term from the end of the GP 8,4,2,....., $\frac{1}{1024}$

251) Find the term of the following GP.
(ii) 4th term from the end of the GP.

252) Find the geometric series whose 5th and 8th terms are 80 and 640 ,respectively .

253) Find the GM between the numbers
(i) 1 and $\frac{9}{16}$

254) Find the GM between the numbers
(ii) a^3b and ab^3 .

255) Find the sum of the series 4+44+444+..n terms.

256) At the end of each yearthe value of a certain machine has depreciated by 20% of its value at the begining of that year. If its initial value was Rs.1250, then find the value at the end of 5 yrs.

257) Insert three GMs between 1 and 256.

258) Find the sum of the following geometric progressions
$\sqrt{7}, \sqrt{21}, \sqrt[3]{7}, \ldots$n terms

259) Find the sum of following gemetric progessions
$1,-a,a^2,-a^3,..$n terms (if $a \neq -1$)

260) Insert two numbers between 9 and 243, so that the resulting sequence is an GP.

261) Insert three numbers between $\frac{1}{3}$ and 432, so that the resulting sequence is a GP.

262) Insert four number between 6 and 192, so that the resulting sequence is an GP.

263) Find two numbers whose arithmetic mean is 34 and the geometric mean is 16.

264) Find the minimum values of the expression
$3^x + 3^{1-x}$, $x \in R$.

265) If x,y,z are positive integers, then prove that $(x + y)(y + z)(z + x) > 8xyz$.

266) Find the sum to infinity of the following GP.
$6,1.2,0.24,\ldots\infty$

267) Find the sum to infinity of the following GP.
$10,-9,8.1,\ldots\infty$

268) A man saved Rs. 66000 in 20 yr. In each succeeding year, after the first year he saved Rs.200 more than what he saved in the previous year. How much did he save in the first year ?
What value is indicated from this question ?

269) The common ratio of a GP is $-\frac{4}{5}$ and the sum to infinity is $\frac{80}{9}$. Find the first term.

270) A person has 2 parents, 4 grandparents and so on. Find the numbers of his ancestors during the ten generations preceding his own.

271) How many terms of the secrets $1+3+3^2+3^3+\ldots$ must be taken to make 3280?

272) Find the sum of the series $\frac{3}{\sqrt{5}} + \frac{4}{\sqrt{5}} + \sqrt{5} + \ldots.+ 25$ terms.

273) The first term of a GP is 27 and its 8th term is $\frac{1}{81}$ Find the sum of its first 10 terms

274) The 2nd and 5th terms of a GP are $\frac{-1}{2}$ and $\frac{1}{16}$

275) Which term of the sequence $\frac{1}{3}$, $\frac{1}{9}$, $\frac{1}{27}$, ...is $\frac{1}{19683}$?

276) If 5th and 8th terms of a GP be 48 and 384 respectively. Find the GP, if terms of GP are real numbers ?

277) In a GP of even number of terms, the sum of all terms is 5 times the sum of the odd terms.Then, common ratio of the GP.

278) If the pth term of an AP is x and qth term is y, show that the sum of (p + q) terms is $\frac{p+q}{2}\left[x+y+\left(\frac{x-y}{p-q}\right)\right]$.

279) The sum of the some terms of a Gp is 315 whose first term and the common ratio are 5 and 2, respectively.Find the last term and the number of terms.

280) If a, b, c be the 1st, 3rd, and nth terms respectively of an AP, prove that the sum to n terms is $\frac{c+a}{2}+\frac{c^2-a^2}{b-a}$

281) The sum of an infinite geometric series is 15 and the sum of the squares of these terms is 45. FInd the series.

282) Find the nth term and the 12th term of the sequence -6,18-54....

283) For what values of k , the numbers- $\frac{2}{7}$,k,-$\frac{2}{7}$ are in GP?

284) Find an infinite GP whose first term is 1 and each term is the sum of all the terms which follow it.

285) Which term of the GP 5,10,20,40,.... is 5120?

286) If a,b and c are in GP, then find the value of \frac {a-b} {b-c}.

287) The sum of first two terms of an infinite GP is 5 and each term is three times the sum of the succeeding terms. Find the GP

288) Find the 8th term from the end of the sequence 3,6,12.....25 th term.

289) If $a^x = b^y = c^z$ and x, y, z are in GP, show that $\log_b a = \log_c b$.

290) If 4th and 9th term of a GP are 54 and 13122 respectively , they find the GP

291) Find the sum of n terms of the series whose nth term is given by $(2n - 1)^2$.

292) Find the sum of n terms of the series $(a + b) + (a^2 + 2b) + (a^3 + 3b) + ...$

293) Find the sum of the n terms of a series $3 \times 1^2 + 5 \times 2^2 + 7 \times 3^2 + \ldots$.

294) Let S be the sum, P be the product and R be the sum of the reciprocals of 3 terms of a GP.Then, find $P^2R^3:S^3$.

295) Find the sum of the series $5^2 + 6^2 + 7^2 + ...+20^2$

296) Find the sum of the following series up to n terms,
$\frac{1^3}{1}+\frac{1^3+2^3}{1+3}+\frac{1^3+2^3+3^3}{1+3}+\quad\ldots$

297) Find a geometric mean of 4 and 16.

298) If a,b,c are respectively ther pth ,qth and rth terms of aGP, Show that
(q - r) log a + (r - p) log b + (p - q) log c=0.

299) Insert 4 GM's between 3 and 96.

300) If a,b,c,d are in GP, then prove that a+b,b+c,c+d are also in GP.

301) Write the first five terms of the sequence whose nth term is $2n^2 + 3$.

302) Find the indicated term in the sequence whose n^{th} term is $a_n = \frac{nn-2)}{n+3}; a_{13}$

303) Find the first four terms of the sequence whose n^{th} term is $a_n=a_{n-1}+3$, n > 1 and $a_1 = 2$.

304) Show that the sequence 8, 12, 16, 20, ... is an A.p. Find its 15th term.

305) Show that the sum of $(m+n)^{th}$ and $(m-n)^{th}$ term of an A.P. is equal to twice the m^{th} term.

306) Find the sum of first 16 terms of an A.P. in which 3^{rd} term is 7 and 7^{th} term is two more than thrice of its 3rd term.

307) Solve 2+5+8+11+.....+ x = 301.

308) If $\frac{b+c-a}{a}, \frac{c+a-b}{b}, \frac{a+b-c}{c}$ are in A.P. then show that $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are also in A.P.

309) Insert three A.M. between 2 and 14.

310) Find the sum of odd integers from 1 to 2001.

311) In an A.P. the first term in 2 and the sum of the first five terms is one-fourth of the next five terms. Show that 20^{th} term is -112.

312) Find the sum to n terms of A.P. whose kth term is 5k + 1.

313) Insert five numbers between 8 and 26 so that the resulting sequence is an A.P.

314) Divide 32 into four parts which are in AP. such that the product of extremes is to the product of means is 7:15.

315) Insert 7 AM's between 2 and 17.

316) Insert AM's between 7 and 71 in such a way that the fifth AM. is 27. Find the number of AM's.

317) The digits of a positive integer having three digits are in AP. and their sum is 15. The number obtained by reversing the digits is 594less than the original number. Find the number.

318) Find the 9^{th} term and the general term of the progression $\frac{1}{4}, \frac{-1}{2}$,1,-2,.....

319) The seventh term of a G.P. is 8 times the fourth term and 5th term is 48. Find the G.P.

320) How many terms of the G.P. 1 + 4 + 16 + 64 + ... will make the sum 5441?

321) If a, b, c and d are in G.P. show that $(a^2+b^2+c^2)(b^2+c^2+d^2) = (ab+bc+cd)^2$

322) If the 4^{th} and 9^{th} terms of a G.P. be 54 and 13122 respectively, find the G.P.

323) Find three numbers in G.P. whose is 52 and the sum of whose products in pairs is 624

324) Find two numbers whose A.M. is 34 and G.M. is 16

325) A square is drawn by joining the mid points of the sides of a square. A third square is drawn inside the second square in the same way and the process is continued indefinitely. If the side of the square is 10 cm. Find the sum of the areas of all the squares so formed

326) The sum of the Series $2^2 + 4^2 + 6^2 + ... + (2n)^2$

327) The sum ofthe series 3 . 8 + 6 . 11 + 9 . 11 +..... + to n terms

328) The sum of the series 1 . 2 . 5 + 2 . 3 . 6 + 3 . 4 . 7+..... to n terms

329) The sum of the series where n^{th} term $2n^2 + 3n^2 - 1$

330) The sum of the series where n^{th} term is $n^3 - 3^n$

331) The fourth, seventh and the last term of a G.P. are 10,80 and 2560 respectively. Find the first term and the number of terms in the G.P.

332) Find the sum of the series 0.7 + 0.77 + 0.777 + ... to n terms.

333) Insert five G.M's between 576 and 9.

334) If a is the A.M of band c and the two G.M's C_1 and C_2 then prove that $C_1^3 + C_2^3 = 2abc$

335) The $(m+n)^{th}$ and (m -n)th terms of G.P are P and q respectively. Show that the m^{th} and n^{th} terms are $\sqrt{pq}$ and $p\left(\frac{p}{q}\right)^{\frac{m}{2n}}$ respectively

336) Find the Sum to n terms of the Series $1^2+3^2+5^2$ + ...to n terms

337) Find the sum of n terms of the series $1.2^2+2.3^2+3.4^2$ + ...

338) Find the sum of n terms of the series whose nth term is $2n^2$ - 3n + 5

339) If the sum of three numbers in A.P. is 24 and their product is 440, find the numbers.

340) Which term of the sequence 8 - 6i, 7 - 4i, 6 - 2i .... is
(i) purely real?
(ii) purely imaginary?

341) Find the sum of all integers between 50 and 500 which are divisible by 7

342) Find four numbers in AP. such that their sum is 20 and sum of their squares is 120

343) The first term of a G.P. is 1. The sum of the third and fifth terms is 90. Find the common ratio of the G.P.

344) Find the sum of the series: $x(x + y) + x^2(x^2+ y^2) + x^3(x^3 + y^3)$ + ... to n terms.

345) Three numbers are in AP. and their sum is 15. If 1, 3, 9 be added to them respectively, they form a G.P. Find the numbers.

346) Sum the following series to n terms: 2 + 10 + 30 + 68 +

347) Three numbers are in G.P. whose sum is 70. If the extremes each multiplied by 4 and the mean by 5, they form an AP. Find the numbers

348) If third and fourth terms in the expansion of $(a + b)^n$ are in the ratio as the fourth and fifth terms in $(a + b)^{n+3}$, find the value of n.

349) Which term of the following sequences:
$\sqrt{3},3,3\sqrt{3}$ ..... is 729?

350) Which term of the following sequences:
$\frac{1}{3}, \frac{1}{9}, \frac{1}{27} \ldots . is \quad \frac{1}{19683}$?

351) Determine the number of terms in the A.P. 4, 8, 12, 288. Also find its 18th term from the end.

352) Which term of the C.P. 2, 8, 32, ... is 32768 ?

353) The fourth term of a C.P. is 4. Find the product of its first seven terms.

354) Find the sum to n terms in the series $5^2 + 6^2 + 7^2$ + ... + 20^2.

355) Find the sum to n terms in the series 3 x 8 + 6 x 11 + 9 x 14 + ...

356) Find the sum to n terms of the series n(n + 1)(n + 4).

357) Find the sum to infinity of the given G.P. $1, \frac{2}{3}, \frac{4}{9}$

358) Find the sum to infinity of the G.P. $\frac{-5}{4}, \frac{5}{16}, \frac{-5}{64}, \ldots$

359) Find the sum to n terms of the series $n^2 + 2^n$.

360) Find the sum to infinity of the G.P. $\left(\sqrt{2}+1\right)+1+\left(\sqrt{2}-1\right)+\ldots\ldots\infty$

361) Find the sum to n terms of the series $(2n - 1)^2$.

362) Find the sum to infinity of the G.P $\frac{2}{5}+\frac{3}{5^2}+\frac{2}{5^3}+\frac{3}{5^4}+\ldots.\infty$

363) Prove that $\left(9^{\frac{1}{3}} \times 9^{\frac{1}{9}} \times 9^{\frac{1}{27}} \times \ldots \infty\right) = 3$

364) Express the 0.3 as rational

365) if x = $a+\frac{a}{r}+\frac{a}{r^2}+\ldots\infty$, y = b - $\frac{b}{r}\frac{b}{r^2}-\ldots\infty$ and z =c + $\frac{c}{r^2}+\frac{c}{r^4}+\ldots\infty$ prove that $\frac{xy}{z}=\frac{ab}{c}$

366) Find the sum to infinity of the given G.P 1, $\frac{1}{3}, \frac{1}{9}$,....

367) Find the sum to infinity of the G.P 6,1.2,.24

368) Find the sum to infinity of the G.P. $5, \frac{20}{7}, \frac{80}{49}$

369) Find the sum to infinity of the G.P. $\frac{-3}{4}, \frac{3}{16}\frac{-3}{64}, \ldots.$

370) If a, b, c are in A.P.; b, c, d are in G.P. and $\frac{a}{c}, \frac{1}{d}, \frac{1}{e}$ are in A.P. prove that a, c, e are in G.P.

371) Find the sum of the following series up to n term .6 + .66 + .666 + ...

372) Find the sum of the first n terms of the series: 3 + 7 + 13 + 21 + 31 + ...

373) If S_1, S_2, S_3 are the sum of first n natural numbers, their squares and their cubes, respectively, show that $9S_2^2 = S_3(1 + 8S_1)$.

374) Prove that $3^{\frac{1}{2}} \times 3^{\frac{1}{4}} \times 3^{\frac{1}{8}} \times \ldots. \infty = 3$.

375) Let x = 1 + a + a^2 + ... and y = 1 + b + b^2 + ... where |a| < 1 and |b| < 1. Prove that 1 + ab + a^2b^2 + .. = $\frac{xy}{x+y-1}$

376) If y = x + x^2 + x^3 + ... ∞ Prove that $x = \frac{y}{1+y}$.

377) Using Geometric series, find the rational number whose decimal expansion is 0.142.

378) Find the sum to infinity of the series $\frac{1}{7} + \frac{2}{7^2} + \frac{1}{7^3} + \frac{2}{7^4} + \ldots. \infty$

379) Find the sum to infinity of the series (x + y) + (x^2 + xy + y^2) + (x^3 + x^2y + xy^2 + y^3) + ...

380) If S1, S2, S3, ... SP denote the sums of infinite geometric series whose first terms are 1, 2, 3, ... P respectively and whose common rations are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots., \frac{1}{P-1}$ respectively Prove that $S_1 + S_2 + S_3 + .. + S_P = \frac{P(P+3)}{2}$

381) Find the sum to infinity $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots$

382) Verify that 10, -9, 8. 1, ... ∞ is a G.P. Find the sum to infinity.

383) Using the concept of geometric series, find the rational number whose decimal expansion is $0.3\overline{56}$.

384) The sum of an infinite G.P. is 8, its second term is 2. Find the common ratio.

385) The sum of an infinite G.P. is 57 and the sum of their cubes is 9747, find the G.P.

386) One side of a square is 10cm. The mid points of its sides are joined to form another square, whose mid points are again joined to form one more square. The process is continued indefinitely.
Find the sum of the areas of all the squares so formed.

387) Find the sum to n terms of the series: 5 + 11 + 19 + 29 + 41...

388) Find the sum to n terms of the series whose n^{th} term is n (n+3).

389) Find the sum of the series 3.8 + 611 + 914 + .. , to n terms.

390) If $\sum_{n=1}^{n} n = 21$ then find the value of $\sum_{n=1}^{n} n^2$

391) Find the sum of the following series.
1·n + 2· (n - 1) + 3· (n - 2) + ... + (n - 1)·2 + n ·1

392) If $S_k = \frac{1+2+\ldots+k}{k}$ then find the value of $S_1^2 + S_2^2 + \ldots + S_n^2$

393) Evaluate $\sum_{r=1}^{n} (3^r - 2^r)$

394) Find the sum of following geometric progressions.
2, 6, 18, ...upto 7 terms

395) Find the sum of following geometric progressions.
$1, \sqrt{3}, 3, 3\sqrt{3}$ ... upto 10 terms

396) Find the sum of following geometric progressions.
0.15, 0.015, 0.0015, ...20 terms

397) Evaluate $\sum_{k=1}^{11}\left(2+3^{k}\right)$

3 Marks 94 x 3 = 282

398) The Fibonacci sequence is defined by 1 = a_1 = a_2 and a_n = a_{n-1} + a_n = a_{n-2} n > 2. Find $\frac{a_{n+1}}{a_n}$, for n = 1, 2, 3, 4 , 5.

399) Find the 20th and nth terms of GP; $\frac{5}{2}$, $\frac{5}{4}$, $\frac{5}{8}$,.....

400) Find a G.P. for which sum of the first two terms is – 4 and the fifth term is 4 times the third term.

401) The first term of a G.P. is 1. The sum of the third term and fifth term is 90. Find the common ratio of G.P.

402) The sum of first three terms of a GP is $\frac{39}{10}$ and their product is 1. Find the common ratio and the terms.

403) If the p^{th} , q^{th} and r^{th} terms of a G.P. are a, b and c, respectively. Prove that $a^{q-r}\, b^{r-p} c^{p-q} = 1$

404) If the first and the n^{th} term of a G.P. are a and b, respectively, and if P is the product of n terms, prove that $p^2 = (ab)^n$.

405) 150 workers were engaged to finish a job in a certain number of days. 4 workers dropped out on second day, 4 more workers dropped out on third day and so on. It took 8 more days to finish the work. Find the number of days in which the work was completed.

406) A farmer buys a used tractor for Rs 12000. He pays Rs 6000 cash and agrees to pay the balance in annual instalments of Rs 500 plus 12% interest on the unpaid amount. How much will the tractor cost him?

407) In a G.P., the 3^{rd} term is 24 and the 6^{th} term is 192.Find the 10^{th} term.

408) Find the sum of first n terms and the sum of first 5 terms of the geometric series $1+\frac{2}{3}+\frac{4}{9}+\ldots$

409) How many terms of the G.P.3, $\frac{3}{2}$, $\frac{3}{4}$, . . . are needed to give the sum $\frac{3069}{512}$?

410) The sum of first three terms of a G.P. is $\frac{13}{12}$ and their product is – 1.Find the common ratio and the terms.

411) Find the sum of the sequence 7, 77, 777, 7777, ... to n terms.

412) A person has 2 parents, 4 grandparents, 8 great grandparents, and so on. Find the number of his ancestors during the ten generations preceding his own.

413) Insert three numbers between 1 and 256 so that the resulting sequence is a G.P.

414) If A.M. and G.M. of two positive numbers a and b are 10 and 8, respectively, find the numbers

415) If a, b, c, d and p are different real numbers such that $(a^2 + b^2 + c^2)p^2 - 2(ab + bc + cd)\, p + (b^2 + c^2 + d^2) \leq 0$, then show that a, b, c and d are in G.P.

416) If f is a function satisfying f (x +y) = f(x) f(y) for all x, y ∈ N such that f(1) = 3 and $\sum_{x=1}^{n} f(x) = 120$ find the value of n.

417) If the sum of n terms of an AP is $(pn + qn^2)$, where p and q are constants, find the common difference.

418) How many terms of the AP 18,16,14,12,.... are needed to give the sum 78? Explain the double answer?

419) If in an AP, $S_n=qn^2$ and $S_m=qm^2$, where Sr denotes the sum of r terms of the AP, then find S_q

420) If the sum of first p terms of an AP is equal to the sum of first q terms , then find the sum of first (p+q) terms

421) The sum of interior angles of a triangler is 180^0 . show that the sum of the interior angles of polygons with 3,4,5,6,..... sides form an arithmetic progession.Find the sum of the interior angles for a 21 sided polygon .

422) The sum of two numbers is $\frac{13}{6}$. An even number of Am's are being inserted between them.The sum of means inserted exceeds the number of means by 1.Find the number of AM's inserted.

423) Show that ($x^2 + xy + y^2$), ($z^2 + xz + x^2$) and ($y^2 + yz + z^2$) are consecutive terms of an AP, if x, y and z are in AP.

424) Between 1 and 31, m AM's have been inserted in such a way that the ratio of the 7th and (m-1)th means is 5:9,Find the value of m.

425) If n arithmetic means are inserted between 20 and 80 such that the ratio of first mean to the last mean is 1 : 3, then find the value of n

426) The 2nd, 31st and last term of an AP are $7\frac{2}{4}$, $\frac{1}{2}$ and - 6 $\frac{1}{2}$, respectively. Find the first term and the number of terms.

427) Find the number of terms common to the two AP's 3, 7, 11, ... 407 and 2, 9, 16, ...709.

428) Find the middle terms in the AP 20, 16, 12, ..., -176.

429) Find the 15th term from the end of the AP 3, 5, 7, 9, ..., 201.

430) Three numbers are in AP. If their sum is 27 and the product 648, find the numbers.

431) Find four numbers in AP whose sum is 20 and the sum of whose squares is 120.

432) In an AP, the first term is 2 and the sum of the first term is 2 and the sum of the first five terms is one - fourth of the next five terms , show that 20th terms is -112.

433) If the nth term of a progression is a linear expression in n, then show that it is an AP.

434) If T_n denotes the nth term of the series 2 + 3 + 6 + 11 + 18 + ..., then find the value of $T_{50.}$

435) If a,b,c,d are in GP , then prove that a^2-b^2,b^2-c^2,c^2-d^2 are also in GP

436) Prove that in a finite GP the product of the terms equidistant from the beginning and the end is always same and equal to the product of first and last term.

437) The sum of the three numbers in GP is 56.If we substract the 1, 7, 21, from these numbers in that order, we obtain an arithmetic progression (AP). Find the numbers.

438) The sum of three numbers in GP is 21 and the sum of their squares is 189. Find the numbers.

439) If x, 2y and 3z are in AP, where the distinct numbers x, y, z are in GP, then find the common ratio of the GP.

440) If A is the arithmetic mean and G_1 , G_2 be two geometeric means between any two numbers, then prove that $\frac{G1^2}{G_2} + \frac{G2^2}{G_1}$ =2A

441) The sum of first three terms of a GP is $\frac{13}{12}$ and their product is -1. Find the terms .

442) Find the three numbers in GP,whose sum is 19 and product is 216.

443) Find all the sequence which are simultaneously arithmetic and geometric progressions.

444) If a,b,c are in AP and b,c,d are in GP and $\frac{1}{c}, \frac{1}{d}, \frac{1}{e}$ are in AP, then prove that a,c,e are in GP.

445) Find the sum of the following series.
5+55+555+...upto n terms.

446) Find the sum of the following series
0.6+0.66+0.666+...

447) Find the sum of the following series
0.3+0.33+0.333+...

448) Represent the following as rational numbers $0.\overline{15}$

449) One side of an equilateral triangle is 18cm.The mid-points of its sides are jioned to form another triangle whose mid-points, in term are jioned to form further another triangle and so on up to infinity.Find the sum of Perimeters of all the triangles.

450) One side of an equilateral triangle is 18cm.The mid-points of its sides are jioned to form another triangle whose mid-points, in term are jioned to form further another triangle and so on up to infinity.Find the sum of Areas of all the triangles

451) If ab + bc + ca $\neq$ 0 and a, b, c are is AP. Prove that a^2 (b + c), b^2 (c + a), c^2 (a + b) are also in AP

452) Find the three numbers in GP,whose sum is 52 and sum of whose product in pairs is 624.

453) In a GP[a_n],if T_1= 3, T_n= 96 and S_n =189 then find n.

454) If $x = a + \frac{a}{r} + \frac{a}{r^2} + \ldots \infty$,$y = b - \frac{b}{r} + \frac{b}{r^2} + \ldots \infty$ and $z = c + \frac{c}{r} + \frac{c}{r^2} + \ldots \infty$, then prove that $\frac{xy}{z} = \frac{ab}{c}$.

455) Prove that $2^{\frac{1}{2}} . 4^{\frac{1}{8}} . 8^{\frac{1}{24}} . 16^{\frac{1}{64}} \ldots . \infty = 2$.

456) The inventor of the chessboard suggested a reward of one grain of wheat for the first square;2 grains for the second; 4 grains for the third and so on, doubling the number of grains for subsequent squares.How many grains would have to be given to the inventor?

457) A man writes a letter to four of his friends.He asks each one of them to copy the letter and mail to four different persons with the instruction that they move the chain similarly.Assuming that the chain is not broken and it costs Rs.2 to mail one letter find the amount spent on postage when 8th set of letters is mailed.

458) Sanjeev deposited Rs.10000 in a bank at the rate of 5% simple interest to annually. Find the amount in 15th year, since he deposited the amount and also calculate the amount after 20 years.

459) Rajeev buys a scooter for Rs.22000.He pays Rs 4000 cash and agrees to pay the balance in annual instalment of Rs 1000 plus 10% interest on the unpaid amount. How much will scooter cost him?

460) The sides of given square is 10 cm. The mid-points of its sides are joined to form a new square.Again, the mid-point of the sides of this new square are joined to from another square . This process is continued indefinitely. Find the sum of the area and the sum of the perimeters of the squares.

461) In an A.P. if m^{th} term is n and the n^{th} term is m, where m $\neq$ n, find the pth term.

462) If the sum of n terms of an A.P. is $n\mathrm{P} + \frac{1}{2}n(n-1)\mathrm{Q}$ where P and Q are constants, find the common difference.

463) The sum of n terms of two arithmetic progressions are in the ratio (3n + 8) : (7n + 15). Find the ratio of their 12^{th} terms.

464) The income of a person is Rs. 3,00,000, in the first year and he receives an increase of Rs.10,000 to his income per year for the next 19 years. Find the total amount, he received in 20 years.

465) Insert 6 numbers between 3 and 24 such that the resulting sequence is an A.P.

466) If p^{th}, q^{th}, r^{th} and s^{th} terms of an A.P. are in G.P, then show that (p – q), (q – r), (r – s) are also in G.P.

467) If a, b, c are in G.P. and $a^{\frac{1}{x}} = b^{\frac{1}{y}} = c^{\frac{1}{z}}$ prove that x, y, z are in A.P.

468) If p,q,r are in G.P. and the equations, $px^2 + 2qx + r = 0$ and $dx^2 + 2ex + f = 0$ have a common root, then show that $\frac{d}{p}, \frac{e}{q}, \frac{f}{r}$ are in A.P.

469) Find the sum of n terms of the series 1· 2 + 2 . 3 + 3 . 4 + 4· 5 + ...

470) Find $(3^3 - 2^3)+(5^3 - 4^3)+(7^3 - 6^3)$ + ... to 10 terms.

471) Find the sum of the an possible products of the first n natural numbers taken two by two.

472) Find the sum to n terms of the series 3 + 15 + 35 + 63 + ...

473) Find the sum of n terms of series $\frac{1}{1\times2} + \frac{1}{2\times3} + \frac{1}{3\times4} + \ldots$

474) Let S_n denotes the sum of the cubes of first n natural numbers and s_n denotes the sum of the first n natural numbers, then find the value of $\sum_{r=1}^{n} \frac{S_r}{s_r}$

475) Find the sum to n terms of the following series.
$\frac{3}{1^2 \cdot 2^2} + \frac{3}{2^2 \cdot 3^2} + \frac{3}{3^2 \cdot 4^2} + \ldots$

476) Find the sum : $\sum_{r=1}^{n} \frac{1}{(ar+b)(ar+a+b)}$

477) Find the sum to n terms of the series
$\frac{1}{1+1^2-1^4} + \frac{2}{1+2^2+2^4} + \frac{3}{1+3^2+4^4} + \ldots$

478) A trophy is to be made out of waste material in the form of equilateral triangl,e as base, on this base another equailateral triangle is kept so that its vertices are mid -point of sides of the base, again another equilateral triangle is kept on the second equilateral triangle obtained in the same manner and process continues. Now sides of each equilateral triangle are decorated with green ribbon to give natural environmental look. If side of equilateral tirangle at the base is 30 cm. Find the total length of ribbon required to decorate the trophy.

479) One side of an equilateral triangle is 24 cm. The mid-point of its sides are joined to form another triangle whose mid-points, in turn, are joined to form still another triangle. The process continues idenfinitely. Find the sum of the perimeters fo all the triangles.

480) An equilateral triangle is drawn by joining the mid-points of the sides of an given equilateral triangle. Athird equilateral triangle is drawn inside the second triangle in the same manner. This process is repeated indefinitely. If each side of the first equilateral triangle is 6 ern, find the sum of the areas of all the triangles.

481) Find $1 + \frac{1}{1+2} + \frac{1}{1+2+3} + \ldots$ to n terms.

482) If the sum of p terms of an AP is q and the sum of q terms is p, then show that the sum of p + q terms is - (p + q). Also, find the sum of first p - q terms (where, p > q).

483) If the sum of mterms of an AP is equal to the sum of either the next n terms or the next p terms; then prove that
$(m+n)\left(\frac{1}{m} - \frac{1}{p}\right) = (m+p)\left(\frac{1}{m} - \frac{1}{n}\right)$

484) In a potato race, 20 potatoes are placed in a line at intervals of 4 m with the first potato 24 m from the starting point. A contestant is required to put the potatoes back to the starting place on that time. How far would he run in bringing back all the potatoes?

485) Let S_n denote the sum of the first n terms of an AP.If $S_{2n} = 3S_n$, then find S_{3n}: Sn

486) Insert four AM'sbetween $\frac{1}{2}$ and 3 and prove that $A_1 + A_2 + A_3 + A_4 = 7$

487) For what values of k, the numbers $\frac{-2}{7}, k, \frac{-7}{2}$ are in GP?

488) If a, band c are in GP, then find the value of $\frac{x-b}{b-c}$

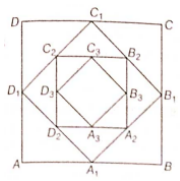
489) If the pth and qth terms of a GP are q and p respectively, then show that its (p + q)th term is $\left(\frac{q^p}{p^q}\right)^{\frac{1}{p-q}}$

490) The (m + n)th and (m - n)th terms of a GP are p and q respectively, Show that the mth and nth terms are $\sqrt{pq}$ and $p\left(\frac{q}{p}\right)^{m/2n}$ respectively,

491) If pth, qth, rth terms of an AP and GP are both a, band c, respectively, then show that
$a^{b-c} \cdot b^{c-a} \cdot c^{a-b} = 1$

Case Study Questions 1 x 4 = 4

492) The side of a given square is 10 cm. The midepoints of its sides are joined to form a new square. Again, the mid-point of the sides of this new square are joined to form another square. This process is continued indefinitely.



Based on above information. Answer the following

(i) The side of the 5th square is equal to

(a) 5 cm **(b)** $\frac{5}{\sqrt{2}}$ cm **(c)** $\frac{5}{2}$ cm **(d)** $\frac{5}{4}$ cm

(ii) The sum of all sides of the square is equal to

(a) $(10+\sqrt{2})$cm **(b)** $(20+10\sqrt{2})$cm **(c)** $(40+20\sqrt{2})$cm **(d) None of these**

(iii) The sum of areas of squares is equal to

(a) $100\ \text{cm}^2$ **(b)** $200\ \text{cm}^2$ **(c)** $400\ \text{cm}^2$ **(d)** $800\ \text{cm}^2$

(iv) The sum of perimeter of all square is equal to

(a) $(80+40\sqrt{2})$cm **(b)** $(40+40\sqrt{2})$cm **(c)** $(80+\sqrt{2})$cm **(d)** $(40+80\sqrt{2})$cm

(v) The sum of diagonal of all square is equal to

(a) $(10+10\sqrt{2})$cm **(b)** $(20+10\sqrt{2})$cm **(c)** $(20+20\sqrt{2})$cm **(d) None of these**

5 Marks 54 x 5 = 270

493) Find the value of n so that $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ may be the geometric mean between a and b.

494) Find the sum to n terms of the sequence, 8, 88, 888, 8888... .

495) The sum of two numbers is 6 times their geometric mean, show that numbers are in the ratio $(3+2\sqrt{2}) : (3-2\sqrt{2})$

496) The sum of three numbers in G.P. is 56. If we subtract 1, 7, 21 from these numbers in that order, we obtain an arithmetic progression. Find the numbers.

497) Which term of the following sequences:

(a) $2, 2\sqrt{2}, 4$ .... is 128?

(b) $\sqrt{3}, 3, 3\sqrt{3}$,..... is 729?

(c) $\frac{1}{3}, \frac{1}{9}, \frac{1}{27} \ldots\ldots is \quad \frac{1}{19683}$?

498) if $\frac{a+bx}{a-bx} = \frac{b+cx}{b-cx} = \frac{c+dx}{c-dx}$ ($x \neq 0$), then show that a,b,c and d are in G.P

499) If a and b are the roots $x^2 - 3x + p = 0$ and c, d are roots of $x^2 - 12x + q = 0$, where a, b, c, d form a G.P. Prove that (q + p) : (q – p) = 17:15.

500) A person writes a letter to four of his friends. He asks each one of them to copy the letter and mail to four different persons with instruction that they move the chain similarly. Assuming that the chain is not broken and that it costs 50 paise to mail one letter. Find the amount spent on the postage when 8th set of letter is mailed.

501) The ratio of the A.M. and G.M. of two positive numbers a and b, is m : n. Show that $a : b = (m+\sqrt{m^2-n^2}) : (m-\sqrt{m^2-n^2})$.

502) A manufacturer reckons that the value of a machine, which costs him Rs. 15625, will depreciate each year by 20%. Find the estimated value at the end of 5 years.

503) Find the sum of the following series up to n terms:

(i) 5 + 55 +555 + ...

(ii) .6 +. 66 +. 666+...

504) The digits of a positive number having three digitsare in AP and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number.

505) A farmer buys a used tractor of Rs.12000 .He pays Rs.6000 cash and agrees to pay the balance in annual instalment of Rs.500 plus 12% interest on the unpaid amount. How much will the tractor cost him?

506) A man deposited Rs.10000 in a bank at the rate of 5 % simple imterest to annually .Find the amount in 15th yr, since he deposited the amount and also calculate the amount after 20 yr.

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

508) If a, b, c, are in AP, then prove that $(b + c)^2 - a^2$, $(c + a)^2 - b^2$, $(a + b)^2 - c^2$ are also in AP.

509) If $a_1, a_2, a_3, \ldots .a_n$ be an AP of non-zero terms, prove that $\frac{1}{a_1 a_2} + \frac{1}{a_2 a_3} + \ldots . + \frac{1}{a_{n-1} a_n} = \frac{n-1}{a_1 a_n}$

510) Let a, b, c be respectively the pth, qth, rth terms of an AP. Prove that a (q - r) + b (r - p) + c (p - q) =9

511) Let a, b, c be respectively the pth, qth, rth terms of an AP. Prove that (a - b) r + (b - c) p + (c - a) q = 0

512) If $a_1, a_2, a_3, \ldots . a_n$ are in AP, where $a_i > 0$ for all i, Show that $\frac{1}{\sqrt{a_1}+\sqrt{a_2}} + \frac{1}{\sqrt{a_2}+\sqrt{a_3}} + \ldots . + \frac{1}{\sqrt{a_{n-1}}+\sqrt{a_n}} = \frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$

513) If $a_1, a_2, \ldots \ldots, a_n$ are in AP with common difference d (where $d \neq 0$); then prove that sum of the series sin d (cosec a_1 cosec a_2 + cosec a_2 cosec a_3 +....+ cosec a_{n-1} cosec a_n) equal to cot a_1 - cot a_n .

514) Find the sum of the following series to n terms. $\frac{1}{1.2.3} + \frac{1}{2.3.4} + \frac{1}{3.4.5} + \ldots \ldots \ldots$

515) Show that $\frac{1\times 2^2+2\times 3^2+\ldots . .+n\times(n+1)^2}{1^2\times 2+2^2\times 3+\ldots . .+n^2\times(n+1)} = \frac{3n+5}{3n+1}$

516) If $S_1, S_2, S_3, \ldots, S_p$ denote the sum of infinite GP whose first terms are 1.2.3..., p respectively and whose common ratios are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots, \frac{1}{p+1}$ respectively. Show that $S_1+S_2+S_3+\ldots+S_p = \frac{p(p+3)}{2}$.

517) In an A.P. if p^{th} term is $\frac{1}{q}$ and q^{th} term is $\frac{1}{p}$ prove that the sum of first pq terms is $\frac{1}{2}$(pq+1), where $p \neq q$.

518) If the sum of a certain number of terms of the A.P. 25, 22, 19, ... is 116, find the last term.

519) The sums of n terms of two arithmetic progressions are on the ratio 5n + 4; 9n + 6. Find the ratio of their 18^{th} terms.

520) Sum of the first p, q and r terms of an A.P. are a, b and c respectively. Prove that
$\frac{a}{p}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q) = 0$

521) The ratio of the sum of m and n terms of an A.p. is m^2:n^2. Show that the ratio of m^{th} and n^{th} term is (2m - 1): (2n - 1).

522) A man starts repaying a loan as first instalment of Rs 100. If he increases the instalment by Rs 5 every month, what amount he will pay in the 30^{th} instalment?

523) The difference between any two consecutive interior angles of a polgon is 5°. If the smallest angle is 120°, find the number of the sides of the polygon.

524) Find the Value of n so that $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ may be the geometric mean between a and b

525) Let sum of n, 2n, 3n terms of an A.P. be S_1, S_2 and S_3 respectively, show that $S_3 = 3 (S_2 - S_1)$

526) Find four numbers in G.P. whose sum is 85 and product is 4096.

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

528) The first term of a G.P. is 1. The sum of the third term and fifth term is 90. Find the common ratio of G.P.

529) The sum of the first four terms of an A.P. is 56. The sum of the last four terms is 112. If its first term is 11, then find the number of terms.

530) if $a\left(\frac{1}{b}+\frac{1}{c}\right), b\left(\frac{1}{c}+\frac{1}{a}\right), c\left(\frac{1}{a}+\frac{1}{b}\right)$ are in AP., prove that a,b are in A.P

531) If the sum of n terms of an A.P. is $8n^2 + 3n$ and its mth term is 507, find the value of m.

532) Find the sum to n terms in the series 1 x 2 + 2 x 3 + 3 x 4 + 4 x 5 + ...

533) Find the sum to n terms in the series 1 x 2 x 3 + 2 x 3 x 4 + 3 x 4 x 5 + ...

534) Let S_n denote the sum of the first n terms of an A.P. If S_{2n} then prove that $\frac{S_{6n}}{S_{6n}} = \frac{17}{4}$

535) Find the sum to n terms in the series $3 \times 1^2 + 5 \times 2^2 + 7 \times 3^2 + ...$

536) if $(b-c)^2$, $(c-a)^2$,$(a-b)^2$ are in A.P., Prove that $\frac{1}{b-c}, \frac{1}{c-a}, \frac{1}{a-b}$ are in A.P

537) If a, b, c are A .P and A_1 is the AM of a and band A_2 is the AM. of band c then prove that the AM of A_1 and A_2 is b

538) Find the sum to n terms of the series $\frac{1}{1\times2}+\frac{1}{2\times3}+\frac{1}{3\times4}+\ldots.$

539) Find the sum to n terms in the series $1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + ...$

540) If continued product of three numbers in G.P. is 64 and the sum of their products in pairs 56, find the numbers.

541) Find the sum to n terms of the series: $1^2 - 2^2 + 3^2 - 4^2 + 5^2 - 6^2 - 7^2 - 8^2$

542) Find the sum of the following series upto n terms:
$\frac{1^3}{1}+\frac{1^3+2^3}{1+3}+\frac{1^3+2^3+3^3}{1+3+5}+\ldots.$

543) The sum of an infinite Geometric series is 15 and the sum of the squares of these terms is 45. Find the series

544) Show that $\frac{1\times2^2+2\times3^2+\ldots+n\times(n+1)^2}{1^2\times2+2^2 3+\ldots+n^2\times(n+1)}=\frac{3n+5}{3n+1}.$

545) One side of an equilateral triangle is 18 em. The midpoints of its sides are joined to form another triangle whose midpoints, in term, are joined to form further another triangle and so on up to infinity. Fine the sum of the (i) Perimeters of all the triangle (ii) area of all the triangles.

546) The lengths of three unequal edges of a rectangular solid block are in GP. If the volume of the block is 216 cm^3 and the total surface area is 252 cm^2, then find the length of its edges

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