MATHEMATICS

ARITHMETIC PROGRESSIONS

1. If the sum of first n terms of an AP be $3n^2 - n$ and it's common difference is 6, then its first term is :

   (A) 2 (B) 3 (C) 1 (D) 4

ANS : A

2. If 7^{th} and 13^{th} terms of an A.P. be 34 and 64, respectively, then it's 18^{th} term is :

   (A) 87 (B) 88 (C) 89 (D) 90

ANS : C

3. The sum of all 2-digit odd numbers is :

   (A) 2475 (B) 2530 (C) 4905 (D) 5049

ANS : A

4. The fourth term of an A.P. is 4. Then the sum of the first 7 terms is :

   (A) 4 (B) 28 (C) 16 (D) 40

ANS : B

5. In an A.P. $s_1 = 6$, $s_7 = 105$, then $s_n : s_{n-3}$ is same as :

   (A) (n + 3) : (n – 3) (B) (n + 3) : n (C) n : (n – 3) (D) None of these

ANS : A

6. In an A.P. $s_3 = 6$, $s_6 = 3$, then it's common difference is equal to :

   (A) 3 (B) – 1 (C) 1 (D) None of these

ANS : B

7. The number of terms common to the two A.P. s

   2 + 5 + 8 + 11 + ….+ 98 and 3 + 8 + 13 + 18 + … + 198

   (A) 33 (B) 40 (C) 7 (D) None of these

ANS : C

8. (p + q)th and (p – q)th terms of an A.P. are respectively m and n, The P^{th} term is :

(A) $\frac{1}{2}$(m + n) (B) $\sqrt{mn}$ (C) m + n (D) mn

ANS : A

9. The first, second and last terms of an A.P. are a, b and 2a. The number of terms in the A.P. is:

(a) $\frac{b}{b-a}$ (B) $\frac{b}{b+a}$ (C) $\frac{a}{b-a}$ (D) $\frac{a}{a+b}$

ANS : A

10. Let s_1, s_2, s_3 be the sums of n terms of three series in A.P., the first term of each being 1 and the common differences 1, 2, 3 respectively. If $s_1 + s_3 = \lambda s_2$, then the value of λ is :

(A) 1 (B) 2 (C) 3 (D) None of these

ANS : B

11. Sum of first 5 terms of an A.P. is one fourth of the sum of next five terms. If the first term = 2, then the common difference of the A.P. is :

(A) 6 (B) – 6 (C) 3 (D) None of these

ANS : B

12. If x, y, z are in A.P., then the value of (x + y – z) (y + z –x) is equal to :

(A) $8yz – 3y^2 – 4z^2$ (B) $8yz – 3z^2 – 4y^2$ (C) $8yz + 3y^2 – 4z^2$ (D) $8yz – 3y^2 + 4z^2$

ANS : A

13. The number of numbers between 105 and 1000 which are divisible by 7 is :

(A) 142 (B) 128 (C) 127 (D) None of these

ANS : C

14. If the numbers a, b, c, d, e form an A.P. then the value of a – 4b + 6c – 4d + e is equal to :

(A) 1 (B) 2 (C) 0 (D) None of these

ANS : C

15. If s_n denotes the sum of first n terms of an A.P., whose common difference is d, then $s_n - 2s_{n-1} + s_{n-2}$

(n > 2) is equal to :

(A) 2d (B) – d (C) d (D) None of these

ANS : C

16. The sum of all 2-digited numbers which leave remainder 1 when divided by 3 is:

(A) 1616 (B) 1602 (C) 1605 (D) None of these

ANS : C

17. The first term of an A.P. of consecutive integers is $p^2 + 1$. The sum of 2p + 1 terms of this series can be expressed as :

(A) $(p + 1)^2$ (B) $(2p + 1)(p + 1)^2$ (C) $(p + 1)^3$ (D) $p3 + (p + 1)^3$

ANS : D

18. If the sum of n terms of an AP is $2n^2$ 5n, then its nth term is –

(A) 4n – 3 (B) 3n – 4 (C) 4n + 3 (D) 3n + 4

ANS : C

19. If the last term of an AP is 119 and the 8th term from the end is 91 then the common difference of the AP is –

(A) 2 (B) 4 (C) 3 (D) – 3

ANS : B

20. If $(a_n) = \{2.5, 2.51, 2.52,....\}$ and $\{b_n\} = \{3.72, 3.73, 3.74,...\}$ be two AP's then $a_{100005} - b_{100005}$ =

(A) – 1.22 (B) 1.22 (C) 1.2 (D) – 1.02

ANS : A

21. For a series whose nth term is $\frac{n}{x} + y$, the sum of r terms is :

(A) $\frac{r(r+1)}{2x} + ry$ (B) $\frac{r(r-1)}{2x}$ (C) $\frac{r(r-1)}{2x} - ry$ (D) $\frac{r(r+1)}{2y} - rx$

ANS : A

22. If $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in A.P., then $\left[\frac{1}{a}+\frac{1}{b}-\frac{1}{c}\right]\left[\frac{1}{b}+\frac{1}{c}-\frac{1}{a}\right]$ is equal to :

(A) $\frac{4}{ac}-\frac{3}{b^2}$ (B) $\frac{b^2-ac}{a^2b^2c^2}$ (C) $\frac{4}{ac}-\frac{1}{b^2}$ (D) None of these

ANS : A

23. The sum of first 24 terms of an A.P. a_1, a_2, a_3,....; if it is known that $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225$, is equal to :

(A) 90 (B) 180 (C) 900 (D) 1800

ANS : C

24. A student read common difference of an AP is – 2 instead of 2 and got the sum of first five terms as – 5. The actual sum of first five terms is :

(A) 25 (B) – 25 (C) – 35 (D) 35

ANS : D

25. The sum of n terms of two A.P's are in the ratio of (7n + 1) : (4n + 27). The ratio of their 11th terms is –

(A) 2 : 3 (B) 4 : 3 (C) 5 : 4 (D) 5 : 6

ANS : B

26. If $1^2 + 2^2 + 3^2 + ...n^2 = 1015$, then the value of n is :

(A) 13 (B) 14 (C) 15 (D) None of these

ANS : B

27. The sum of the series $\frac{1}{2}+\frac{1}{3}+\frac{1}{6}+$ ... upto 9 terms is:

(A) $-\frac{5}{6}$ (B) $-\frac{1}{2}$ (C) 1 (D) $-\frac{3}{2}$

ANS : D

28. The sum of first n odd natural numbers is:

(A) n^2 (B) 2n (C) $\frac{n(n-1)}{2}$ (D) $\frac{n(n+1)}{2}$

ANS : A

29. If the roots of the equation $x^3 - 12x^2 + 39x - 28 = 0$ are in A.P., then their common difference will be:

(A) $\pm$ 1 (B) $\pm$ 2 (C) $\pm$ 3 (D) $\pm$ 4

ANS : C

30. If A.M between two numbers is 5 and their G.M. is 4, then their H.M. is:

(A) $\frac{16}{5}$ (B) $\frac{14}{5}$ (C) $\frac{11}{5}$ (D) None of these

ANS : A

31. If A is the single A.M. between two numbers a and b and S is the sum of n A.M.'s between them, then $\frac{S}{A}$ depends upon:

(A) n, a, b (B) n, a (C) n, b (D) n

ANS : D

32. If the A.M. between the roots of a quadratic equation is 8 and the G.M. is 5, then the equation is:

(A) $x^2 + 10x - 25 = 0$ (B) $x^2 - 8x + 5 = 0$

(C) $x^2 - 16x + 25 = 0$ (D) $x^2 - 16x - 25 = 0$

ANS : C

33. If c is the harmonic mean between a and b, then $\frac{c}{a} + \frac{c}{b}$ is equal to:

(A) 2 (B) $\frac{a+b}{ab}$ (C) $\frac{ab}{a+b}$ (D) None of these

ANS : A

34. If a,b,c,d,e,f are in A.P. then e-c is equal to :

(A) 2(c – a) (B) 2(f – d) (C) 2(d – c) (D) d – c

ANS : C

35. 20th term of the series : $\frac{1^3}{1} + \frac{1^3+2^3}{1+3} + \frac{1^3+2^3+3^3}{1+3+5}$ + ... is :

(A) $\frac{441}{4}$ (B) $\frac{443}{2}$ (C) $\frac{445}{2}$ (D) $\frac{439}{2}$

ANS : A

36. If the value of $1^3 + 2^3 + 3^3 + \ldots + n^3 = 2025$, then the value of $1 + 2 + 3 + \ldots + n$ is:

(A) 675 (B) 81 (C) 45 (D) 285

ANS : C

37. If the value of $1 + 2 + 3 + \ldots + n$ is 55, then the value of $1^3 + 2^3 + 3^3 + \ldots + n^3$ is:

(A) 165 (B) 385 (C) 3025 (D) 555

ANS : C

38. The nth term of the series 1 + $\frac{1+2}{2}+\frac{1+2+3}{3}+$ … is :

(A) $\frac{n-1}{2}$ (B) $\frac{n^2+1}{2}$ (C) $\frac{n+1}{2}$ (D) $\frac{n^2-1}{2}$

ANS : C

39. $1^2 + 1 + 2^2 + 2 + 3^2 + 3 + \ldots + n^2 + n$ is equal to :

(A) $\frac{n(n+1)}{2}$ (B) $\left[\frac{n(n+1)}{2}\right]^2$ (C) $\frac{n(n+1)(n+2)}{3}$ (D) $\frac{n(n+)(n+2)(n+3)}{4}$

ANS : C

40. The next term of the sequence $\frac{1}{4},\frac{1}{36},\frac{1}{144}$ …is :

(A) $\frac{1}{576}$ (B) $\frac{1}{400}$ (C) $\frac{1}{1296}$ (D) None of these

ANS : B

41. If the sum of first n natural numbers is one-fifth of the sum of their squares, then n equals:

(A) 5 (B) 6 (C) 7 (D) 8

ANS : C

42. The nth term of the series 1 + 3 + 6 +10 + 15 + … is :

(A) $\frac{n(n+1)}{2}$ (B) $n^2 - n + 1$ (C) n (n + 1) (D) None of these

ANS : A

43. The sum of the series $1^2 + 1 + 2^2 + 2 + 3^2 + 3 + \ldots$ + up to n terms is :

(A) $\frac{n(n+1)}{2}$ (B) $\frac{n(n+1)(n+2)}{3}$ (C) $\left[\frac{n(n+1)}{2}\right]^2$ (D) None of these

ANS : D

44. The nth term of the sequence 1, $\sqrt{2},3^{\frac{1}{3}},2^{\frac{1}{2}}$,… is :

(A) $n^{\frac{1}{n}}$ (B) n^n (C) $\left(\frac{1}{n}\right)^n$ (D) None of these\

ANS : A

45. The sum of n terms of the series $(1^2 - 2^2) + (3^2 - 4^2) + (5^2 - 6^2) + ,,,$ is :

(A) $\frac{n(n+1)}{2}$ (B) $\frac{-n(n+1)}{2}$ (C) – n(2n + 1) (D) None of these

ANS : C

46. If A_1 and A_2 be the two A.M.s between two numbers p and q, then $(2A_1 - A_2)(2A_2 - A_1)$ is equal to :

(A) p + q (B) p – q (C) pq (D) None of these

ANS : C

47. If $\frac{1}{a}, \frac{a^n + b^n}{a^{n+1} + b^{n+1}}, \frac{1}{b}$ are in A.P., then n is equal to :

(A) 0 (B) – 1 (C) $\frac{1}{2}$ (D) None of these

ANS : B

48. If $S_n = nP + \frac{1}{2} n(n - 1) Q$ where S_n denotes the sum of the first n terms of an A.P., then the common difference of the A.P. is

(A) P + Q (B) 2P + 3Q (C) 2Q (D) Q

ANS : D

49. If a,b,c are positive reals, then least value of (a + b+ c) $\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$ is :

(A) 1 (B) 6 (C) 9 (D) None of these

ANS : C

50. The sum of first four terms of an A.P. is 56 and sum of last four terms is 112. If the first term is 11, then the number of terms is :

(A) 10 (B) 12 (C) 11 (D) None of these

ANS : C

51. For an A.P., $S_{2n} = 3S_n$. The value of $\frac{S_{3n}}{S_n}$ is equal to :

(A) 4 (B) 6 (C) 8 (D) 10

ANS : B

52. The ratio of the 7th to the (n – 1)th mean between 1 and 31, when n arithmetic means are inserted between then, is 5 : 9. The value of n is :

(A) 12 (B) 13 (C) 14 (D) 15

ANS : C

53. The first, second and last terms of an A.P. are a,b, and 2a respectively, the sum of the series is :

(A) $\frac{3ab}{2(b+a)}$ (B) $\frac{3ab}{2(b-a)}$ (C) $\frac{3ab}{2(a-b)}$ (D) None of these

ANS: B

54. Sum of first m terms of an A.P. is 0. If a be the first term of the A.P., then the sum of next n terms is :

(A) $\frac{-a(m+n)m}{m-1}$ (B) $\frac{-a(m+n)n}{m-1}$ (C) $\frac{-a(m+n)n}{n-1}$ (D) $\frac{-a(m+n)m}{n-1}$

ANS : B

55. If A_1 and A_2 be the two A.M.s between two numbers a and b, then $A_2 – A_1$ is equal to

(A) a + b (B) b – a (C) $\frac{b-a}{3}$ (D) None of these

ANS : C

56. The sum of terms equidistant from the beginning and end in an A.P. is equal to :

(A) Last term (B) First term

(C) Sum of the first and the last term (D) None of these

ANS : C

57. If the sum of the roots of the equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals then bc^2, ca^2, ab^2 are in:

(A) A.P. (B) G.P. (C) H.P. (D) None of these

ANS : A

58. If a_1, a_2, a_3,….a_n are in A.P. and $a_1 > 0$ for all I, then : $\frac{1}{\sqrt{a_1}+\sqrt{a_2}}+\frac{1}{\sqrt{a_2}+\sqrt{a_3}}+\ldots+\frac{1}{\sqrt{a_{n-1}}+\sqrt{a_n}}$ =

(A) $\frac{n}{\sqrt{a_1}+\sqrt{a_n}}$ (B) $\frac{n}{\sqrt{a_n}-\sqrt{a_1}}$ (C) $\frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$ (D) None of these

ANS : C

59. If a,b,c are in A.P. and also $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in A.P., then:

(A) a = b ≠ c (B) a ≠ b = c (C) a = b = c (D) a ≠ b ≠ c

ANS : C

60. If a,b,c are in H.P., then $\frac{a-b}{b-c}$ equals :

(A) $\frac{b}{a}$ (B) $\frac{a}{b}$ (C) $\frac{a}{c}$ (D) None of these

ANS : C

61. An, A.P. consists pf n (odd) terms and it's middle term is m. Then the sum of the A.P. is :

(A) 2mn (B) $\frac{1}{2}mn$ (C) mn (D) mn^2

ANS : C

62. If A,G and H denote respectively the A.M., G.M. and H.M. between two positive numbers a and b, then A-G is equal to :

(A) a – b (B) $\frac{2ab}{a+b}$ (C) $\frac{1}{2}(\sqrt{a}-\sqrt{b})^2$ (D) None of these

ANS : C

63. If the roots of the equation $x^3 - 12x^2 + 39x - 28 = 0$ are in A.P., then their common difference is :

(A) ± 1 (B) ± 2 (C) ± 3 (D) ± 4

ANS : C

64. The sum of the n terms of the series $\frac{4}{3}+\frac{10}{9}+\frac{28}{27}$ + … is :

(A) $\frac{3^n(2n+1)+1}{2(3^n)}$ (B) $\frac{3^n(2n+1)-1}{2(3^n)}$ (C) $\frac{n3^n-1}{2(3^n)}$ (D) $\frac{3^n-1}{2}$

ANS : B

65. If the third term of a G.P. is p, then the product of it's first 5 terms is :

(A) p^3 (B) p^2 (C) p^{10} (D) p^5

ANS : D

66. If $a_1, a_2, \ldots\ldots a_n$ are n A.M's between a and b, then $2\sum_{i=1}^{n} a_i$ =

(A) ab (B) n (a + b) (C) $\frac{n(a+b)}{ab}$ (D) $\frac{a+b}{n}$

ANS : B

67. $4^{\frac{1}{2}} x 4^{\frac{1}{4}} x 4^{\frac{1}{8}}$ x ..... to ∞ is a root of the equation :

(A) $x^2 - 4 = 0$ (B) $x^2 - 4x + 6 = 0$ (C) $x^2 - 5x + 4 = 0$ (D) $x^2 - 3x + 2 = 0$

ANS : C

68. If a,b,c are in A.P., then which one of the following is not true?

(A) a + k, b + k, c + k are in A.P. (B) ka, kb, kc are in A.P.

(C) a^2, b^2, c^2 are in A.P. (D) a + b, c + a, b + c are in A.P.

ANS : C

69. The sum of the series: $\frac{1}{\sqrt{1}+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + ... + \frac{1}{\sqrt{n^2-1}+\sqrt{n^2}}$ is equal to

(A) $\frac{2n+1}{\sqrt{n}}$ (B) $\frac{\sqrt{n}+1}{\sqrt{n}+\sqrt{n-1}}$ (C) $\frac{n+\sqrt{n^2-1}}{2\sqrt{n}}$ (D) n – 1

ANS : D

70. Sum of infinite number of terms of a G.P. is 20 and sum of their squares is 100. The common ratio of the G.P. is :

(A) 5 (B) $\frac{3}{5}$ (C) $\frac{8}{5}$ (D) $\frac{1}{5}$

ANS : B

71. $1^3 - 2^3 + 3^3 - 4^3 + ... + 9^3$ =

(A) 425 (B) – 425 (C) 475 (D) – 475

ANS : A

72. If $y = x - x^2 + x^3 - x^4 + ...$ to ∞, then the value of x will be $(-1 < x < 1)$:

(A) $y + \frac{1}{y}$ (B) $\frac{y}{1+y}$ (C) $y - \frac{1}{y}$ (D) $\frac{y}{1-y}$

ANS : D

73. The two geometric means between 1 and 64 are:

(A) 1 and 64 (B) 8 and 16 (C) 4 and 16 (D) 3 and 16

ANS : C

74. The sum of infinite terms of the geometric progression $\frac{\sqrt{2+1}}{\sqrt{2-1}}, \frac{1}{2-\sqrt{2},}\frac{1}{2}$,...is :

(A) $\sqrt{2}\left(\sqrt{2}+1\right)^2$ (B) $\left(\sqrt{2}+1\right)^2$ (C) $5\sqrt{2}$ (D) $3\sqrt{2}+\sqrt{5}$

ANS : A

75. If the nth term of the geometric progression, $5,-\frac{5}{2},\frac{5}{4},-\frac{5}{8},...is\frac{5}{1024},$ then the value of n is

(A) 11 (B) 10 (C) 9 (D) 4

ANS : A

76. In a harmonic progression, pth term is q and qth term is p, then the (pq)th term is:

(A) $\frac{p+q}{pq}$ (B) 0 (C) $\frac{pq}{p+q}$ (D) 1

ANS : D

77. Suppose a,b,c are A.P. and a^2,b^2,c^2 are in G.P. If a < b < c and a + b + c = $\frac{3}{2}$; then the value of a is:

(A) $\frac{1}{2\sqrt{2}}$ (B) $\frac{1}{2\sqrt{3}}$ (C) $\frac{1}{2}-\frac{1}{\sqrt{3}}$ (D) $\frac{1}{2}-\frac{1}{\sqrt{2}}$

ANS : D

78. Let the positive numbers a,b,c,d be in A.P., then abc, abd, acd, bcd are:

(A) Not in A.P./G.P./H.P. (B) In A.P.

(C) In G.P. (D) In H.P.

ANS : D

79. If the sum of the first 2n terms of the A.P. 2, 5, 8,... is equal to the sum of first n term of the A.P.57, 59, 61,... then n equals :

(A) 10 (B)12 (C)11 (D) 13

ANS : C

80. If $\frac{3+5+7+...upto\ n\ terms}{5+8+11+...upto\ 10\ terms}=7$, then the value of n is:

(A) 35 (B) 36 (C) 37 (D) 40

ANS : A

81. If a, b, c are in G.P., then the equations $ax^2 + 2bx + c = 0$ and $dx^2 + 2ex + f = 0$ have a common root if

$\frac{d}{a},\frac{e}{b},\frac{f}{c}$ are in:

(A) G.P. (B) A.P. (C) H.P. (D) None of these

ANS : B

82. Consider an infinite geometric series with first term a and common ratio r. If it's sum is 4 and the second term is $\frac{3}{4}$, then :

(A) $a=\frac{7}{4},r=\frac{3}{7}$ (B) $a=2,r=\frac{3}{8}$ (C) $a=\frac{3}{2},r=\frac{1}{2}$ (D) $a=3,r=\frac{1}{4}$

ANS : D

83. If 4th term of an H.P. is 5 and 5th term is 4, then it's 20th term is:

(A) Zero (B) $\frac{4}{5}$ (C) 1 (D) $\frac{5}{4}$

ANS : C

84. H.M. between two numbers is 4. The A.M. 'A' and the G.M. 'G' between them satisfy the relation $2A + G^2 = 27$. The numbers are:

(A) 6, 3 (B) 4, 2 (C) 6, 9 (D) 3, 5

ANS : A

85. The sum of an infinite G.P. is 3. The sum of the series formed by squaring its terms is also 3. The series is:

(A) $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+...$ (B) $\frac{3}{2}+\frac{3}{4}+\frac{3}{8}+\frac{3}{16}+...$

(C) $\frac{1}{3}+\frac{1}{9}+\frac{1}{27}+\frac{1}{81}+...$ (D) $1-\frac{1}{3}+\frac{1}{3^2}+-\frac{1}{3^3}+...$

ANS : B

86. If first three terms of a sequence $\frac{1}{16}, a, b, \frac{1}{6}$ are in G.P. and last three are in H.P., then values of a and b are respectively :

(A) $-\frac{1}{4}, 1$ (B) $\frac{1}{12}, \frac{1}{9}$

(C) Both (A) and (B) are true (D) $\frac{1}{9}, \frac{1}{12}$

ANS : C

87. The sum of few terms of a ratio series is 728, if common ratio is 3 and last term is 486, then first term of the series is :

(A) 1 (B) 2 (C) 3 (D) 4

ANS : B

88. The 6th term of a G.P. is 32 and it's 8th term is 128; the common ratio of the G.P. is :

(A) – 1 (B) 2 (C) 4 (D) – 4

ANS : B

89. If H is the harmonic mean between a and b, then $\frac{H+a}{H-a}+\frac{H+b}{H-b}$ is equal to: [AMU]

(A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) 2 (D) None of these

ANS : C

90. Let A_1, A_2 be two AMs and G_1, G_2 be two GMs between a and b, then $\frac{A_1+A_2}{G_1\ G_2}$ =

(A) $\frac{a+b}{2ab}$ (B) $\frac{2ab}{a+b}$ (C) $\frac{a+b}{ab}$ (D) $\frac{a+b}{\sqrt{ab}}$

ANS : C

91. a,b,c are three unequal numbers such that a,b,c are in A.P. ; b – a, c – b, a are in G.P. then a : b :c : :

(A) 1 : 2 : 4 (B) 2 : 3: 5 (C) 1 : 2: 3 (D) 1 :3 : 5

ANS : C

92. The first two terms of an infinite G.P. are together equal to 5 and every term is 3 times the sum of all the terms that follow it ; the common ratio of the G.P. is :

(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) 3 (D) 4

ANS : B

93. The eighth term of a G.P. is 128 and common ratio is 2. The product of it's first five terms is:

(A) 4^6 (B) 4^3 (C) 4^5 (D) 4^4

ANS : C

94. The sum of infinity of $\frac{1}{7}+\frac{2}{7^2}+\frac{1}{7^3}+\frac{2}{7^4}+$ ... is :

(A) $\frac{3}{16}$ (B) $\frac{1}{5}$ (C) $\frac{1}{24}$ (D) $\frac{1}{16}$

ANS : A

95. p,q,r are in A.P. and each is numerically less than 1. Let :

$x = 1 + p + p^2 +$ ..... to ∞

$y = 1 + q + q^2 +$ ..... to ∞

$z = 1 + r + r^2 +$ ..... to ∞, then x,y,z are in

(A) A.P. (B) G.P. (C) H.P. (D) None of these

ANS : C

96. If the numbers p,q,r are in A.P., then m^{7p}, m^{7q}, m^{7r} (m > 0) are in :

(A) A.P. (B) G.P. (C) H.P. (D) None of these

ANS : B

97. If the pth, qth and rth terms of a G.P. are ℓ, m and n respectively, then $\ell^{q-r} m^{r-p} n^{p-q}$ is :

(A) 1 (B) 0 (C) pqr (D) ℓ mn

ANS : A

98. $\frac{1}{1x2}+\frac{1}{2x3}+\frac{1}{3x4}+....+\frac{1}{n(n+1)}$ equals :

(A) $\frac{n+1}{n}$ (B) $\frac{n(n+1)}{6}$ (C) $\frac{n}{n+1}$ (D) $\frac{n^2}{n+1}$

ANS : C

99. Sum of n terms of the series $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}+\frac{15}{16}$ +.... is equal to :

(A) $2^n - n - 1$ (B) $1 - 2^{-n}$ (C) $2^n - 1$ (D) $n + 2^{-n} - 1$

ANS : D

100. If $a^x = b^y = c^z$ and a,b,c are in G.P. then x, y,z are in :

(A) A.P. (B) G.P. (C) H.P. (D) None of these

ANS : C