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DPP: Arithmetic Progression

General term of an Arithmetic progression

Basic Level

1. The sequence $\frac{5}{\sqrt{7}}, \frac{6}{\sqrt{7}}, \sqrt{7}$........ is

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

2. p^{th} term of the series $\left(3-\frac{1}{n}\right)+\left(3-\frac{2}{n}\right)+\left(3-\frac{3}{n}\right)+.....$ will be

(a) $\left(3+\frac{p}{n}\right)$ (b) $\left(3-\frac{p}{n}\right)$ (c) $\left(3+\frac{n}{p}\right)$ (d) $\left(3-\frac{n}{p}\right)$

3. If the 9^{th} term of an A.P. be zero, then the ratio of its 29^{th} and 19^{th} term is

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

4. Which of the following sequence is an arithmetic sequence

(a) $f(n) = an + b; n \in N$ (b) $f(n) = kr^n; n \in N$ (c) $f(n) = (an+b)kr^n; n \in N$ (d) $f(n) = \frac{1}{a\left(n+\frac{b}{n}\right)}; n \in N$

5. If the p^{th} term of an A.P. be q and q^{th} term be p, then its r^{th} term will be

(a) $p+q+r$ (b) $p+q-r$ (c) $p+r-q$ (d) $p-q-r$

6. If the 9^{th} term of an A.P. is 35 and 19^{th} is 75, then its 20^{th} term will be

(a) 78 (b) 79 (c) 80 (d) 81

7. If $(a+1), 3a, (4a+2)$ are in A.P. then 7^{th} term of the series is

(a) $10a+4$ (b) – 33 (c) 33 (d) $10a - 4$

8. It x, y, z are in A.P., then its common difference is

(a) $\sqrt{x^2 - yz}$ (b) $\sqrt{y^2 - xz}$ (c) $\sqrt{z^2 - xy}$ (d) None of these

9. The 10^{th} term of the sequence $\sqrt{3}, \sqrt{12}, \sqrt{27}$, ...is

(a) $\sqrt{243}$ (b) $\sqrt{300}$ (c) $\sqrt{363}$ (d) $\sqrt{432}$

10. Which term of the sequence $(-8+18i), (-6+15i), (-4+12i)$, ...is purely imaginary

(a) 5^{th} (b) 7^{th} (c) 8^{th} (d) 6^{th}

11. If $(m+2)^{th}$ term of an A.P. is $(m+2)^2 - m^2$, then its common difference is

(a) 4 (b) – 4 (c) 2 (d) – 2

12. For an A.P., $T_2 + T_5 - T_3 = 10$, $T_2 + T_9 = 17$, then common difference is

(a) 0 (b) 1 (c) – 1 (d) 13

Advance Level

13. If $\tan n\theta = \tan m\theta$, then the different values of θ will be in

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

14. If the p^{th}, q^{th} and r^{th} term of an arithmetic sequence are *a*, *b* and *c* respectively, then the value of [a $(q - r)$+$b(r - p)$+ c $(p - q)$]=

(a) 1 (b) – 1 (c) 0 (d) $\frac{1}{2}$

15. If n^{th} terms of two A.P.'s are $3n + 8$ and $7n + 15$, then the ratio of their 12^{th} terms will be

(a) $\frac{4}{9}$ (b) $\frac{7}{16}$ (c) $\frac{3}{7}$ (d) $\frac{8}{15}$

16. The 6^{th} term of an A.P. is equal to 2, the value of the common difference of the A.P. which makes the product $a_1 a_4 a_5$ least is given by

(a) $\frac{8}{5}$ (b) $\frac{5}{4}$ (c) $\frac{2}{3}$ (d) None of these

17. If p times the p^{th} term of an A.P. is equal to q times the q^{th} term of an A.P., then $(p+q)^{th}$ term is

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

18. The numbers $t(t^2+1)$, $-\frac{1}{2}t^2$ and 6 are three consecutive terms of an A.P. If t be real, then the next two terms of A.P. are

(a) –2, –10 (b) 14, 6 (c) 14, 22 (d) None of these

19. If the p^{th} term of the series 25, $22\frac{3}{5}$, $20\frac{1}{2}$, $18\frac{1}{4}$,...... is numerically the smallest, then p=

(a) 11 (b) 12 (c) 13 (d) 14

20. The second term of an A.P. is $(x - y)$ and the 5^{th} term is $(x + y)$, then its first term is

(a) $x - \frac{1}{3}y$ (b) $x - \frac{2}{3}y$ (c) $x - \frac{4}{3}y$ (d) $x - \frac{5}{3}y$

21. The number of common terms to the two sequences 17, 21, 25, ...417 and 16, 21, 26, ... 466 is

(a) 21 (b) 19 (c) 20 (d) 91

22. In an A.P. first term is 1. If $T_1 T_3 + T_2 T_3$ is minimum, then common difference is

(a) –5/4 (b) –4/5 (c) 5/4 (d) 4/5

23. Let the sets A={2, 4, 6, 8,......} and B= {3, 6, 9, 12, ...}, and $n(A)$ = 200, $n(B)$ = 250. Then

(a) $n(A \cap B) = 67$ (b) $n(A \cup B) = 450$ (c) $n(A \cap B) = 66$ (d) $n(A \cup B) = 384$

Sum to n terms of an Arithmetic progression

Basic Level

24. The sum of first *n* natural numbers is

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

25. The sum of the series $\frac{1}{2}+\frac{1}{3}+\frac{1}{6}+......$ to 9 terms is

(a) $-\frac{5}{6}$ (b) $-\frac{1}{2}$ (c) 1 (d) $-\frac{3}{2}$

26. The sum of all natural numbers between 1 and 100 which are multiples of 3 is

(a) 1680 (b) 1683 (c) 1681 (d) 1682

27. The sum of 1+3+5+7+..... upto n terms is

(a) $(n+1)^2$ (b) $(2n)^2$ (c) n^2 (d) $(n-1)^2$

28. If the sum of the series 2+ 5+ 8+11 .... is 60100, then the number of terms are

(a) 100 (b) 200 (c) 150 (d) 250

29. If the first term of an A.P. be 10, last term is 50 and the sum of all the terms is 300, then the number of terms are

(a) 5 (b) 8 (c) 10 (d) 15

30. The sum of the numbers between 100 and 1000 which is divisible by 9 will be

(a) 55350 (b) 57228 (c) 97015 (d) 62140

31. If the sum of three numbers of a arithmetic sequence is 15 and the sum of their squares is 83, then the numbers are

(a) 4, 5, 6 (b) 3, 5, 7 (c) 1, 5, 9 (d) 2, 5, 8

32. If the sum of three consecutive terms of an A.P. is 51 and the product of last and first term is 273, then the numbers are

(a) 21, 17, 13 (b) 20, 16, 12 (c) 22, 18, 14 (d) 24, 20, 16

33. There are 15 terms in an arithmetic progression. Its first term is 5 and their sum is 390. The middle term is

(a) 23 (b) 26 (c) 29 (d) 32

34. 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 is

(a) $P+Q$ (b) $2P+3Q$ (c) $2Q$ (d) Q

35. The sum of numbers from 250 to 1000 which are divisible by 3 is

(a) 135657 (b) 136557 (c) 161575 (d) 156375

36. Four numbers are in arithmetic progression. The sum of first and last term is 8 and the product of both middle terms is 15. The least number of the series is

(a) 4 (b) 3 (c) 2 (d) 1

37. The number of terms of the A.P. 3, 7, 11, 15 ...... to be taken so that the sum is 406 is

(a) 5 (b) 10 (c) 12 (d) 14

38. The consecutive odd integers whose sum is $45^2 - 21^2$ are

(a) 43, 45, ..., 75 (b) 43, 45,...... 79 (c) 43, 45, ..., 85 (d) 43, 45, ..., 89

39. If common difference of m A.P.'s are respectively 1, 2,...... m and first term of each series is 1, then sum of their m^{th} terms is

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

40. The sum of all those numbers of three digits which leave remainder 5 after division by 7 is

(a) 551 × 129 (b) 550 × 130 (c) 552 × 128 (d) None of these

41. If $S_n = n^2 p$ and $S_m = m^2 p, m \neq n,$ in A.P., then S_p is

(a) p^2 (b) p^3 (c) p^4 (d) None of these

42. An A.P. consists of n (odd terms) and its middle term is m. Then the sum of the A.P. is

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

43. The minimum number of terms of $1+3+5+7+.....$ that add up to a number exceeding 1357 is

(a) 15 (b) 37 (c) 35 (d) 17

Advance Level

44. If the ratio of the sum of n terms of two A.P.'s be $(7n+1) : (4n+27)$, then the ratio of their 11^{th} terms will be

(a) 2 : 3 (b) 3 : 4 (c) 4 : 3 (d) 5 : 6

45. The interior angles of a polygon are in A.P. If the smallest angle be 120° and the common difference be 5, then the number of sides is

(a) 8 (b) 10 (c) 9 (d) 6

46. The sum of integers from 1 to 100 that are divisible by 2 or 5 is

(a) 3000 (b) 3050 (c) 4050 (d) None of these

47. If the sum of first n terms of an A.P. be equal to the sum of its first m terms, $(m \neq n)$, then the sum of its first $(m + n)$ terms will be

(a) 0 (b) n (c) m (d) $m + n$

48. If $a_1, a_2, ..., a_n$ are in A.P. with common difference d, then the sum of the following series is

$\sin d\,(\text{coses } a_1 . \text{cosec } a_2 + \text{cosec } a_2 . \text{cosec } a_3 + ... + \text{cosec } a_{n-1} \text{ cosec } a_n)$

(a) $\sec a_1 - \sec a_n$ (b) $\cot a_1 - \cot a_n$ (c) $\tan a_1 - \tan a_n$ (d) $\text{cosec } a_1 - \text{cosec } a_n$

49. The odd numbers are divided as follows

1 3
5 7 9 11
13 15 17 19 21 23
. . . . . .
. . . . . .
. . . . . .

Then the sum of n^{th} row is

(a) $2^{n-2}[2^n + 2^{n-1} - 1]$ (b) $\frac{1}{2}(2n+1)$ (c) $2n$ (d) $4n^3$

50. If the sum of n terms of an A.P. is $2n^2 + 5n$, then the n^{th} term will be

(a) $4n+3$ (b) $4n+5$ (c) $4n+6$ (d) $4n+7$

51. The nth term of an A.P. is $3n-1$. Choose from the following the sum of its first five terms

(a) 14 (b) 35 (c) 80 (d) 40

52. If the sum of two extreme numbers of an A.P. with four terms is 8 and product of remaining two middle term is 15, then greatest number of the series will be

(a) 5 (b) 7 (c) 9 (d) 11

53. The ratio of sum of m and n terms of an A.P. is $m^2 : n^2$, then the ratio of m^{th} and n^{th} term will be

(a) $\frac{m-1}{n-1}$ (b) $\frac{n-1}{m-1}$ (c) $\frac{2m-1}{2n-1}$ (d) $\frac{2n-1}{2m-1}$

54. The value of x satisfying $\log_a x + \log_{\sqrt{a}} x + \log_{\sqrt[3]{a}} x + ... + \log_{\sqrt[n]{a}} x = \frac{a+1}{2}$ will be

(a) $x = a$ (b) $x = a^a$ (c) $x = a^{-1/a}$ (d) $x = a^{1/a}$

55. Sum of first n terms in the following series $\cot^{-1} 3 + \cot^{-1} 7 + \cot^{-1} 13 + \cot^{-1} 21 + ...$ is given by

(a) $\tan^{-1}\left(\frac{n}{n+2}\right)$ (b) $\cot^{-1}\left(\frac{n+2}{n}\right)$ (c) $\tan^{-1}(n+1) - \tan^{-1} 1$ (d) All of these

56. Let S_n denotes the sum of n terms of an A.P. If $S_{2n} = 3S_n$, then ratio $\frac{S_{3n}}{S_n} =$

(a) 4 (b) 6 (c) 8 (d) 10

57. If the sum of the first n terms of a series be $5n^2 + 2n$, then its second term is

(a) 7 (b) 17 (c) 24 (d) 42

58. All the terms of an A.P. are natural numbers. The sum of its first nine terms lies between 200 and 220. If the second term is 12, then the common difference is

(a) 2 (b) 3 (c) 4 (d) None of these

59. If $S_1 = a_2 + a_4 + a_6 + ...$up to 100 terms and $S_2 = a_1 + a_3 + a_5 + ...$ up to 100 terms of a certain A.P. then its common difference d is

(a) $S_1 - S_2$ (b) $S_2 - S_1$ (c) $\frac{S_1 - S_2}{2}$ (d) None of these

60. In the arithmetic progression whose common difference is non-zero, the sum of first $3n$ terms is equal to the sum of the next n terms. Then the ratio of the sum of the first $2n$ terms to the next $2n$ terms is

(a) $\frac{1}{5}$ (b) $\frac{2}{3}$ (c) $\frac{3}{4}$ (d) None of these

61. If the sum of n terms of an A.P. is $nA + n^2B$, where A, B are constants, then its common difference will be

(a) $A - B$ (b) $A + B$ (c) $2A$ (d) $2B$

Arithmetic mean

Basic Level

62. A number is the reciprocal of the other. If the arithmetic mean of the two numbers be $\frac{13}{12}$, then the numbers are

(a) $\frac{1}{4}, \frac{4}{1}$ (b) $\frac{3}{4}, \frac{4}{3}$ (c) $\frac{2}{5}, \frac{5}{2}$ (d) $\frac{3}{2}, \frac{2}{3}$

63. The arithmetic mean of first n natural number

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

64. The four arithmetic means between 3 and 23 are

(a) 5, 9, 11, 13 (b) 7, 11, 15, 19 (c) 5, 11, 15, 22 (d) 7, 15, 19, 21

65. The mean of the series a, $a + nd$, $a + 2nd$ is

(a) $a + (n-1)d$ (b) $a + nd$ (c) $a + (n+1)d$ (d) None of these

66. If n A.M. s are introduced between 3 and 17 such that the ratio of the last mean to the first mean is 3 : 1, then the value of n is

(a) 6 (b) 8 (c) 4 (d) None of these

Advance Level

67. The sum of n arithmetic means between a and b, is

(a) $\frac{n(a+b)}{2}$ (b) $n(a+b)$ (c) $\frac{(n+1)(a+b)}{2}$ (d) $(n+1)(a+b)$

68. Given that n A.M.'s are inserted between two sets of numbers a, $2b$ and $2a$, b, where $a, b \in R$. Suppose further that m^{th} mean between these sets of numbers is same, then the ratio $a : b$ equals

(a) $n - m + 1 : m$ (b) $n - m + 1 : n$ (c) $n : n - m + 1$ (d) $m : n - m + 1$

69. Given two number a and b. Let A denote the single A.M. and S denote the sum of n A.M.'s between a and b, then S/A depends on

(a) n, a, b (b) n, b (c) n, a (d) n

70. The A.M. of series $a+(a+d)+(a+2d)+.....+(a+2nd)$ is

(a) $a+(n-1)d$ (b) $a+nd$ (c) $a+(n-1)d$ (d) None of these

71. If 11 AM's are inserted between 28 and 10, then three mid terms of the series are

(a) $\frac{41}{2}, 19, \frac{35}{2}$ (b) $20, \frac{41}{2}, \frac{43}{2}$ (c) $20, \frac{61}{2}, \frac{62}{3}$ (d) $20, 22, 24$

72. If $f(x+y, x-y)=xy$, then the arithmetic mean of $f(x,y)$ and $f(y,x)$ is

(a) x (b) y (c) 0 (d) 1

73. If A.M. of the roots of a quadratic equation is $\frac{8}{5}$ and the A.M. of their reciprocals is $\frac{8}{7}$, then the quadratic equation is

(a) $7x^2+16x+5=0$ (b) $7x^2-16x+5=0$ (c) $5x^2-16x+7=0$ (d) $5x^2-8x+7=0$

74. If a_1=0 and $a_1, a_2, a_3, ...a_n$ are real numbers such that $|a_i|=|a_{i-1}+1|$ for all i, then A.M. of the numbers $a_1, a_2, ...a_n$ has the value x where

(a) $x<1$ (b) $x<-\frac{1}{2}$ (c) $x \geq -\frac{1}{2}$ (d) $x=\frac{1}{2}$

75. If A.M. of the numbers 5^{1+x} and 5^{1-x} is 13 then the set of possible real values of x is

(a) $\{5, \frac{1}{5}\}$ (b) $\{1, -1\}$ (c) $\{x \mid x^2-1| = 0, x \in R\}$ (d) None of these

Properties of A.P.

Basic Level

76. If $2x, x+8, 3x+1$ are in A.P., then the value of x will be

(a) 3 (b) 7 (c) 5 (d) – 2

77. If $\log_3 2, \log_3(2^x-5)$ and $\log_3\left(2^x-\frac{7}{2}\right)$ are in A.P., then x is equal to

(a) $1, \frac{1}{2}$ (b) $1, \frac{1}{3}$ (c) $1, \frac{3}{2}$ (d) None of these

78. If a_m denotes the m^{th} term of an A.P., then $a_m=$

(a) $\frac{a_{m+k}+a_{m-k}}{2}$ (b) $\frac{a_{m+k}-a_{m-k}}{2}$ (c) $\frac{2}{a_{m+k}+a_{m-k}}$ (d) None of these

79. If $1, \log_y x, \log_z y, -15\log_x z$ are in A.P., then

(a) $z^3=x$ (b) $x=y^{-1}$ (c) $z^{-3}=y$ (d) $x=y^{-1}=z^3$

(e) All of these

80. If $\frac{1}{p+q}, \frac{1}{r+p}, \frac{1}{q+r}$ are in A.P., then

(a) p, q, r are in A.P. (b) p^2, q^2, r^2 are in A.P. (c) $\frac{1}{p}, \frac{1}{q}, \frac{1}{r}$ are in A.P. (d) None of these

81. If a, b, c, are in A.P., then b^2-ac is equal to

(a) $\frac{1}{4}(a+c)^2$ (b) $\frac{1}{4}(a-c)^2$ (c) $\frac{1}{2}(a+c)^2$ (d) $\frac{1}{2}(a-c)^2$

82. If $a_1, a_2, a_3, ...$ are in A.P. then a_p, a_q, a_r are in A.P. if p, q, r are in

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

Advance Level

83. If the sum of the roots of the equation $ax^2+bx+c=0$ be equal to the sum of the reciprocals of their squares, then bc^2, ca^2, ab^2 will be in

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

84. If $\frac{1}{b-c}, \frac{1}{c-a}, \frac{1}{a-b}$ be consecutive terms of an A.P., then $(b-c)^2, (c-a)^2, (a-b)^2$ will be in

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

85. If a^2, b^2, c^2 are in A.P., then $(b+c)^{-1}$, $(c+a)^{-1}$ and $(a+b)^{-1}$ will be in

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

86. If the sides of a right angled triangle are in A.P., then the sides are proportional to

(a) 1, 2, 3 (b) 2, 3, 4 (c) 3, 4, 5 (d) 4, 5, 6

87. If a, b, c are in A.P., then the straight line $ax + by + c = 0$ will always pass through the point

(a) $(-1, -2)$ (b) $(1, -2)$ (c) $(-1, 2)$ (d) $(1, 2)$

88. If a, b, c are in A.P. then $\frac{(a-c)^2}{(b^2-ac)} =$

(a) 1 (b) 2 (c) 3 (d) 4

89. If a, b, c, d, e, f are in A.P., then the value of $e - c$ will be

(a) $2(c-a)$ (b) $2(f-d)$ (c) $2(d-c)$ (d) $d-c$

90. If p, q, r are in A.P. and are positive, the roots of the quadratic equation $px^2 + qx + r = 0$ are all real for

(a) $\left|\frac{r}{p}-7\right| \geq 4\sqrt{3}$ (b) $\left|\frac{p}{r}-7\right| < 4\sqrt{3}$ (c) All p and r (d) No p and r

91. If $a_1, a_2, a_3, ... a_n$ are in A.P., where $a_i > 0$ for all i, then the value of $\frac{1}{\sqrt{a_1}+\sqrt{a_2}} + \frac{1}{\sqrt{a_2}+\sqrt{a_3}} + ... + \frac{1}{\sqrt{a_{n-1}}+\sqrt{a_n}} =$

(a) $\frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}$ (b) $\frac{n+1}{\sqrt{a_1}+\sqrt{a_n}}$ (c) $\frac{n-1}{\sqrt{a_1}-\sqrt{a_n}}$ (d) $\frac{n+1}{\sqrt{a_1}-\sqrt{a_n}}$

92. Given $a+d > b+c$ where a, b, c, d are real numbers, then

(a) a, b, c, d are in A.P. (b) $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$ are in A.P.

(c) $(a+b), (b+c), (c+d), (a+d)$ are in A.P. (d) $\frac{1}{a+b}, \frac{1}{b+c}, \frac{1}{c+d}, \frac{1}{a+d}$ are in A.P.

93. If a, b, c are in A.P., then $(a + 2b - c)\ (2b + c - a)\ (c + a - b)$ equals

(a) $\frac{1}{2}abc$ (b) abc (c) $2abc$ (d) $4abc$

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

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(a) ± 1 (b) ± 2 (c) ± 3 (d) ± 4

95. If $1, \log_9(3^{1-x}+2), \log_3(4.3^x-1)$ are in A.P., then x equals

(a) $\log_3 4$ (b) $1-\log_3 4$ (c) $1-\log_4 3$ (d) $\log_4 3$

96. If *a, b, c, d, e* are in A.P. then the value of *a*+*b*+4*c* – 4*d* + *e* in terms of *a*, if possible is

(a) $4a$ (b) $2a$ (c) 3 (d) None of these

97. If $a_1, a_2, a_3, \ldots\ldots a_{2n+1}$ are in A.P. then $\frac{a_{2n+1}-a_1}{a_{2n+1}+a_1}+\frac{a_{2n}-a_2}{a_{2n}+a_2}+\ldots\ldots+\frac{a_{n+2}-a_n}{a_{n+2}+a_n}$ is equal to

(a) $\frac{n(n+1)}{2}\cdot\frac{a_2-a_1}{a_{n+1}}$ (b) $\frac{n(n+1)}{2}$ (c) $(n+1)(a_2-a_1)$ (d) None of these

98. If the non-zero numbers *x*, *y*, *z* are in A.P. and $\tan^{-1}x, \tan^{-1}y, \tan^{-1}z$ are also in A.P., then

(a) $x=y=z$ (b) $xy=yz$ (c) $x^2=yz$ (d) $z^2=xy$

99. If three positive real numbers *a*, *b*, *c* are in A.P. such that *abc* =4, then the minimum value of *b* is

(a) $2^{1/3}$ (b) $2^{2/3}$ (c) $2^{1/2}$ (d) $2^{3/2}$

100. If $\sin\alpha, \sin^2\alpha, 1, \sin^4\alpha$ and $\sin^5\alpha$ are in A.P., where $-\pi<\alpha<\pi$, then α lies in the interval

(a) $(-\pi/2, \pi/2)$ (b) $(-\pi/3, \pi/3)$ (c) $(-\pi/6, \pi/6)$ (d) None of these

101. If the sides of a triangle are in A.P. and the greatest angle of the triangle is double the smallest angle, the ratio of the sides of the triangle is

(a) 3 : 4 : 5 (b) 4 : 5 : 6 (c) 5 : 6 : 7 (d) 7 : 8 : 9

102. If *a, b, c* of a ΔABC are in A.P., then $\cot\frac{C}{2}=$

(a) $3\tan\frac{A}{2}$ (b) $3\tan\frac{B}{2}$ (c) $3\cot\frac{A}{2}$ (d) $3\cot\frac{B}{2}$

103. If *a, b, c* are in A.P. then the equation $(a-b)x^2+(c-a)x+(b-c)=0$ has two roots which are

(a) Rational and equal (b) Rational and distinct (c) Irrational conjugates (d) Complex conjugates

104. The least value of '*a*' for which $5^{1+x}+5^{1-x}, \frac{a}{2}, 25^x+25^{-x}$ are three consecutive terms of an A.P. is

(a) 10 (b) 5 (c) 12 (d) None of these

105. $\alpha,\beta,\gamma,\delta$ are in A.P. and $\int_0^2 f(x)dx=-4$, where $f(x)=\begin{vmatrix} x+\alpha & x+\beta & x+\alpha-\gamma \\ x+\beta & x+\gamma & x-1 \\ x+\gamma & x+\delta & x-\beta+\delta \end{vmatrix}$, then the common difference *d* is

(a) 1 (b) –1 (c) 2 (d) – 2

106. If the sides of a right angled triangle form an A.P. then the sines of the acute angles are

(a) $\frac{3}{5}, \frac{4}{5}$ (b) $\sqrt{3}, \frac{1}{3}$ (c) $\sqrt{\frac{\sqrt{5}-1}{2}}, \sqrt{\frac{\sqrt{5}+1}{2}}$ (d) $\frac{\sqrt{3}}{2}, \frac{1}{2}$

107. If x, y, z are positive numbers in A.P., then

(a) $y^2 \ge xz$ (b) $y \ge 2\sqrt{xz}$

(c) $\frac{x+y}{2y-x}+\frac{y+z}{2y-z}$ has the minimum value 2 (d) $\frac{x+y}{2y-x}+\frac{y+z}{2y-z}\ge 4$