11 - Std ACHIEVEMENT TEST – 2023 - 2024

Time : 1.30 Hrs **Maths** Marks : 100

1. Let A and B be subsets of the universal set N, the set of natural numbers. Then $A' \cup [(A \cap B) \cup B']$ is
   (1) A (2) A' (3) B (4) N
2. If $n((A \times B) \cap (A \times C)) = 8$ and $n(B \cap C) = 2$, then $n(A)$ is
   (1) 6 (2) 4 (3) 8 (4) 16
3. For non-empty sets A and B, if $A \subset B$ then $(A \times B) \cap (B \times A)$ is equal to
   (1) $A \cap B$ (2) $A \times A$ (3) $B \times B$ (4) none of these.
4. Let R be the universal relation on a set X with more than one element. Then R is
   (1) not reflexive (2) not symmetric (3) transitive (4) none of the above
5. The range of the function $\frac{1}{1-2\sin x}$ is
   (1) $(-\infty,-1) \cup (\frac{1}{3}, \infty)$ (2) $(-1, \frac{1}{3})$ (3) $[-1, \frac{1}{3}]$ (4) $(-\infty,-1] \cup [\frac{1}{3}, \infty)$.
6. The rule $f(x) = x^2$ is a bijection if the domain and the co-domain are given by
   (1) R,R (2) R , $(0,\infty)$ (3) $(0,\infty)$, R (4) $[0,\infty)$, $[0,\infty)$
7. If the function $f : [-3, 3] \to S$ defined by $f(x) = x^2$ is onto, then S is
   (1) $[-9, 9]$ (2) R (3) $[-3, 3]$ (4) $[0, 9]$
8. Let $f : R \to R$ be defined by $f(x) = 1 - |x|$. Then the range of f is
   (1) R (2) $(1,\infty)$ (3) $(-1,\infty)$ (4) $(-\infty, 1]$
9. Given that x,y and b are real numbers $x < y, b > 0$, then
   (1) $xb < yb$ (2) $xb > yb$ (3) $xb \le yb$ (4) $\frac{x}{b} \ge \frac{y}{b}$
10. The solution set of the following inequality $|x-1| \ge |x-3|$ is
    (1) $[0,2]$ (2) $[2,\infty)$ (3) $(0,2)$ (4) $(-\infty,2)$
11. The value of $\log_3 \frac{1}{81}$ is
    (1) −2 (2) −8 (3) −4 (4) −9
12. The value of $\log_a b \log_b c \log_c a$ is
    (1) 2 (2) 1 (3) 3 (4) 4
13. Find a so that the sum and product of the roots of the equation $2x^2 + (a-3)x + 3a - 5 = 0$ are equal is
    (1) 1 (2) 2 (3) 0 (4) 4
14. The number of solutions of $x^2 + |x-1| = 1$ is
    (1) 1 (2) 0 (3) 2 (4) 3
15. If 8 and 2 are the roots of $x^2 + ax + c = 0$ and 3,3 are the roots of $x^2 + dx + b = 0$, then the roots of the equation $x^2 + ax + b = 0$ are
    (1) 1,2 (2) −1,1 (3) 9,1 (4) −1,2
16. If a and b are the real roots of the equation $x^2 - kx + c = 0$, then the distance between the points (a,0) and (b,0) is
    (1) $\sqrt{k^2-4c}$ (2) $\sqrt{4k^2-c}$ (3) $\sqrt{4c-k^2}$ (4) $\sqrt{k-8c}$
17. $\frac{1}{\cos 80^\circ} - \frac{\sqrt{3}}{\sin 80^\circ} =$
    (1) $\sqrt{2}$ (2) $\sqrt{3}$ (3) 2 (4) 4
18. The maximum value of $4\sin^2 x + 3\cos^2 x + \sin\frac{x}{2} + \cos\frac{x}{2}$ is
    (1) $4+\sqrt{2}$ (2) $3+\sqrt{2}$ (3) 9 (4) 4
19. $\cos 1^\circ + \cos 2^\circ + \cos 3^\circ + ... + \cos 179^\circ =$
    (1) 0 (2) 1 (3) -1 (4) 89
20. Which of the following is not true?
    (1) $\sin\theta = -\frac{3}{4}$ (2) $\cos\theta = -1$ (3) $\tan\theta = 25$ (4) $\sec\theta = \frac{1}{4}$
21. If $\tan\alpha$ and $\tan\beta$ are the roots of $x^2 + ax + b = 0$, then $\frac{\sin(\alpha+\beta)}{\sin\alpha\sin\beta}$ is equal to
    (1) $\frac{b}{a}$ (2) $\frac{a}{b}$ (3) $-\frac{a}{b}$ (4) $-\frac{b}{a}$
22. If $f(\theta) = |\sin\theta| + |\cos\theta|, \theta \in R$, then $f(\theta)$ is in the interval
    (1) $[0,2]$ (2) $[1,\sqrt{2}]$ (3) $[1,2]$ (4) $[0,1]$
23. If $\sin\alpha + \cos\alpha = b$, then $\sin 2\alpha$ is equal to
    (1) b^2-1, if $b \le \sqrt{2}$ (2) b^2-1, if $b > \sqrt{2}$ (3) b^2-1, if $b \ge 1$ (4) b^2-1, if $b \ge \sqrt{2}$
24. In a $\triangle ABC$, if (i) $\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2} > 0$ (ii) $\sin A \sin B \sin C > 0$ then
    (1) Both (i) and (ii) are true (2) Only (i) is true
    (3) Only (ii) is true (4) Neither (i) nor (ii) is true.
25. In an examination there are three multiple choice questions and each question has 5 choices. Number of ways in which a student can fail to get all answer correct is
    (1) 125 (2) 124 (3) 64 (4) 63
26. The number of 5 digit numbers all digits of which are odd is
    (1) 25 (2) 5^5 (3) 5^6 (4) 625.

27. The product of r consecutive positive integers is divisible by
(1) $r!$ (2) $(r-1)!$ (3) $(r+1)!$ (4) r^r.

28. There are 10 points in a plane and 4 of them are collinear. The number of straight lines joining any two points is
(1) 45 (2) 40 (3) 39 (4) 38 .

29. Number of sides of a polygon having 44 diagonals is ……
(1) 4 (2) 4! (3) 11 (4) 22

30. In ${}^{2n}C_3 : {}^{n}C_3 = 11 : 1$ then n is
(1) 5 (2) 6 (3) 11 (4) 7

31. The number of ways of choosing 5 cards out of a deck of 52 cards which include at least one king is
(1) ${}^{52}C_5$ (2) ${}^{48}C_5$ (3) ${}^{52}C_5 + {}^{48}C_5$ (4) ${}^{52}C_5 - {}^{48}C_5$.

32. $1 + 3 + 5 + 7 + \cdots + 17$ is equal to
(1) 101 (2) 81 (3) 71 (4) 61

33. The coefficient of x^6 in $(2+2x)^{10}$ is
(1) ${}^{10}C_6$ (2) 2^6 (3) ${}^{10}C_6 2^6$ (4) ${}^{10}C_6 2^{10}$.

34. If a is the arithmetic mean and g is the geometric mean of two numbers, then
(1) $a \le g$ (2) $a \ge g$ (3) $a = g$ (4) $a > g$.

35. The sequence $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}+\sqrt{2}}, \frac{1}{\sqrt{3}+2\sqrt{2}}, \cdots$ form an
(1) AP (2) GP (3) HP (4) AGP.

36. The remainder when 38^{15} is divided by 13 is
(1) 12 (2) 1 (3) 11 (4) 5

37. The n^{th} term of the sequence 1,2,4,7,11, ⋯ is
(1) $n^3 + 3n^2 + 2n$ (2) $n^3 - 3n^2 + 3n$ (3) $\frac{n(n+1)(n+2)}{3}$ (4) $\frac{n^2-n+2}{2}$

38. The sum up to n terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \cdots$ is
(1) $\frac{n(n+1)}{2}$ (2) $2n(n+1)$ (3) $\frac{n(n+1)}{\sqrt{2}}$ (4) 1.

39. The coefficient of x^5 in the series e^{-2x} is
(1) $\frac{2}{3}$ (2) $\frac{3}{2}$ (3) $\frac{-4}{15}$ (4) $\frac{4}{15}$.

40. The value of $1 - \frac{1}{2}\left(\frac{2}{3}\right) + \frac{1}{3}\left(\frac{2}{3}\right)^2 - \frac{1}{4}\left(\frac{2}{3}\right)^3 + \cdots$ is
(1) $\log\left(\frac{5}{3}\right)$ (2) $\frac{3}{2}\log\left(\frac{5}{3}\right)$ (3) $\frac{5}{3}\log\left(\frac{5}{3}\right)$ (4) $\frac{2}{3}\log\left(\frac{2}{3}\right)$.

41. The equation of the locus of the point whose distance from y-axis is half the distance from origin is
(1) $x^2 + 3y^2 = 0$ (2) $x^2 - 3y^2 = 0$ (3) $3x^2 + y^2 = 0$ (4) $3x^2 - y^2 = 0$

42. If the point $(8, -5)$ lies on the locus $\frac{x^2}{16} - \frac{y^2}{25} = k$, then the value of k is
(1) 0 (2) 1 (3) 2 (4) 3

43. The slope of the line which makes an angle 45° with the line $3x - y = -5$ are
(1) $1, -1$ (2) $\frac{1}{2}, -2$ (3) $1, \frac{1}{2}$ (4) $2, -\frac{1}{2}$

44. The intercepts of the perpendicular bisector of the line segment joining (1,2) and (3,4) with coordinate axes are
(1) $5, -5$ (2) 5,5 (3) 5,3 (4) $5, -4$

45. Equation of the straight line perpendicular to the line $x - y + 5 = 0$, through the point of intersection the y-axis and the given line
(1) $x - y - 5 = 0$ (2) $x + y - 5 = 0$ (3) $x + y + 5 = 0$ (4) $x + y + 10 = 0$

46. The line $(p + 2q)x + (p - 3q)y = p - q$ for different values of p and q passes through the point
(1) $\left(\frac{3}{2}, \frac{5}{2}\right)$ (2) $\left(\frac{2}{5}, \frac{2}{5}\right)$ (3) $\left(\frac{3}{5}, \frac{3}{5}\right)$ (4) $\left(\frac{2}{5}, \frac{3}{5}\right)$

47. The length of ⊥ from the origin to the line $\frac{x}{3} - \frac{y}{4} = 1$, is
(1) $\frac{11}{5}$ (2) $\frac{5}{12}$ (3) $\frac{12}{5}$ (4) $-\frac{5}{12}$

48. If one of the lines given by $6x^2 - xy + 4cy^2 = 0$ is $3x + 4y = 0$, then c equals to
(1) -3 (2) -1 (3) 3 (4) 1

49. If $a_{ij} = \frac{1}{2}(3i - 2j)$ and $A = [a_{ij}]_{2\times 2}$ is
(1) $\begin{bmatrix} \frac{1}{2} & 2 \\ -\frac{1}{2} & 1 \end{bmatrix}$ (2) $\begin{bmatrix} \frac{1}{2} & -\frac{1}{2} \\ 2 & 1 \end{bmatrix}$ (3) $\begin{bmatrix} 2 & 2 \\ \frac{1}{2} & -\frac{1}{2} \end{bmatrix}$ (4) $\begin{bmatrix} -\frac{1}{2} & \frac{1}{2} \\ 1 & 2 \end{bmatrix}$

50. If $A = \begin{bmatrix} \lambda & 1 \\ -1 & -\lambda \end{bmatrix}$, then for what value of λ, $A^2 = 0$?
(1) 0 (2) ± 1 (3) -1 (4) 1

51. If $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ and $(A + B)^2 = A^2 + B^2$, then the values of a and b are
(1) $a = 4, b = 1$ (2) $a = 1, b = 4$ (3) $a = 0, b = 4$ (4) $a = 2, b = 4$

52. If A is a square matrix, then which of the following is not symmetric?
(1) $A + A^T$ (2) AA^T (3) A^TA (4) $A - A^T$

53. The value of x, for which the matrix $A = \begin{bmatrix} e^{x-2} & e^{7+x} \\ e^{2+x} & e^{2x+3} \end{bmatrix}$ is singular

(1) 9 (2) 8 (3) 7 (4) 6

54. If the points $(x, -2), (5,2), (8,8)$ are collinear, then x is equal to

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

55. A root of the equation $\begin{vmatrix} 3-x & -6 & 3 \\ -6 & 3-x & 3 \\ 3 & 3 & -6-x \end{vmatrix} = 0$ is

(1) 6 (2) 3 (3) 0 (4) -6

56. If $a \neq b, b, c$ satisfy $\begin{vmatrix} a & 2b & 2c \\ 3 & b & c \\ 4 & a & b \end{vmatrix} = 0$, then abc =

(1) $a + b + c$ (2) 0 (3) b^3 (4) $ab + bc$

57. If $\vec{a} + 2\vec{b}$ and $3\vec{a} + m\vec{b}$ are parallel, then the value of m is

(1) 3 (2) $\frac{1}{3}$ (3) 6 (4) $\frac{1}{6}$

58. If $\overrightarrow{BA} = 3\hat{i} + 2\hat{j} + \hat{k}$ and the position vector of B is $\hat{i} + 3\hat{j} - \hat{k}$, then the position vector A is

(1) $4\hat{i} + 2\hat{j} + \hat{k}$ (2) $4\hat{i} + 5\hat{j}$ (3) $4\hat{i}$ (4) $-4\hat{i}$

59. One of the diagonals of parallelogram ABCD with $\vec{a}$ and $\vec{b}$ as adjacent sides is $\vec{a} + \vec{b}$. The other diagonal $\overrightarrow{BD}$ is

(1) $\vec{a} - \vec{b}$ (2) $\vec{b} - \vec{a}$ (3) $\vec{a} + \vec{b}$ (4) $\frac{\vec{a}+\vec{b}}{2}$

60. If $\vec{a}, \vec{b}, \vec{c}$ are the position vectors of three collinear points, then which of the following is true?

(1) $\vec{a} = \vec{b} + \vec{c}$ (2) $2\vec{a} = \vec{b} + \vec{c}$ (3) $\vec{b} = \vec{c} + \vec{a}$ (4) $4\vec{a} + \vec{b} + \vec{c} = \vec{0}$

61. If $\lambda\hat{i} + 2\lambda\hat{j} + 2\lambda\hat{k}$ is a unit vector, then the value of λ is

(1) $\frac{1}{3}$ (2) $\frac{1}{4}$ (3) $\frac{1}{9}$ (4) $\frac{1}{2}$

62. The value of $\theta \in \left(0, \frac{\pi}{2}\right)$ for which the vectors $\vec{a} = (\sin\theta)\hat{i} + (\cos\theta)\hat{j}$ and $\vec{b} = \hat{i} - \sqrt{3}\hat{j} + 2\hat{k}$ are perpendicular, is equal to (1) $\frac{\pi}{3}$ (2) $\frac{\pi}{6}$ (3) $\frac{\pi}{4}$ (4) $\frac{\pi}{2}$

63. If (1,2,4) and $(2, -3\lambda - 3)$ are the initial and terminal points of the vector $\hat{i} + 5\hat{j} - 7\hat{k}$, then the value of λ is equal to

(1) $\frac{7}{3}$ (2) $-\frac{7}{3}$ (3) $-\frac{5}{3}$ (4) $\frac{5}{3}$

64. If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = 2\hat{i} + x\hat{j} + \hat{k}$, $\vec{c} = \hat{i} - \hat{j} + 4\hat{k}$ and $\vec{a} \cdot (\vec{b} \times \vec{c}) = 70$, then x is equal to

(1) 5 (2) 7 (3) 26 (4) 10

65. $\lim_{x \to \pi/2} \frac{2x-\pi}{\cos x}$ (1) 2 (2) 1 (3) -2 (4) 0

66. $\lim_{x \to \infty} \left(\frac{x^2+5x+3}{x^2+x+3}\right)^x$ is (1) e^4 (2) e^2 (3) e^3 (4) 1

67. $\lim_{x \to \infty} \frac{\sqrt{x^2-1}}{2x+1} =$ (1) 1 (2) 0 (3) -1 (4) $\frac{1}{2}$

68. $\lim_{x \to 3} \lfloor x \rfloor =$ (1) 2 (2) 3 (3) does not exist (4) 0

69. $\lim_{\alpha \to \pi/4} \frac{\sin\alpha - \cos\alpha}{\alpha - \frac{\pi}{4}}$ is (1) $\sqrt{2}$ (2) $\frac{1}{\sqrt{2}}$ (3) 1 (4) 2

70. $\lim_{x \to 0} \frac{e^{\sin x} - 1}{x} =$ (1) 1 (2) e (3) $\frac{1}{e}$ (4) 0

71. At $x = \frac{3}{2}$ the function $f(x) = \frac{|2x-3|}{2x-3}$ is

(1) continuous (2) discontinuous (3) differentiable (4) non-zero

72. Let f be a continuous function on [2,5]. If f takes only rational values for all x and f(3) = 12, then f(4.5) is equal to (1) $\frac{f(3)+f(4.5)}{7.5}$ (2) 12 (3) 17.5 (4) $\frac{f(4.5)-f(3)}{1.5}$

73. If $y = f(x^2 + 2)$ and $f'(3) = 5$, then $\frac{dy}{dx}$ at $x = 1$ is

(1) 5 (2) 25 (3) 15 (4) 10

74. If $y = mx + c$ and $f(0) = f'(0) = 1$, then f(2) is

(1) 1 (2) 2 (3) 3 (4) -3

75. If the derivative of $(ax - 5)e^{3x}$ at $x = 0$ is -13, then the value of a is

(1) 8 (2) -2 (3) 5 (4) 2

76. The differential coefficient of $\log_{10} x$ with respect to $\log_x 10$ is

(1) 1 (2) $-(\log_{10} x)^2$ (3) $(\log_x 10)^2$ (4) $\frac{x^2}{100}$

77. If $y = \frac{(1-x)^2}{x^2}$, then $\frac{dy}{dx}$ is

(1) $\frac{2}{x^2} + \frac{2}{x^3}$ (2) $-\frac{2}{x^2} + \frac{2}{x^3}$ (3) $-\frac{2}{x^2} - \frac{2}{x^3}$ (4) $-\frac{2}{x^3} + \frac{2}{x^2}$

78. If $f(x) = \begin{cases} x+1, & \text{when } x < 2 \\ 2x-1 & \text{when } x \geq 2 \end{cases}$, then $f'(2)$ is

(1) 0 (2) 1 (3) 2 (4) does not exist

79. If $f(x) = \begin{cases} x+2, & -1 < x < 3 \\ 5 & x = 3 \\ 8-x & x > 3 \end{cases}$, then at $x = 3$, $f(x)$ is

(1) 1 (2) −1 (3) 0 (4) does not exist

80. The number of points in $\mathbb{R}$ in which the function $f(x) = |x-1| + |x-3| + \sin x$ is not differentiable, is

(1) 3 (2) 2 (3) 1 (4) 4

81. If $\int \frac{3^{\frac{1}{x}}}{x^2} dx = k\left(3^{\frac{1}{x}}\right) + c$, then the value of k is

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

82. $\int \frac{\sqrt{\tan x}}{\sin 2x} dx$ is

(1) $\sqrt{\tan x} + c$ (2) $2\sqrt{\tan x} + c$ (3) $\frac{1}{2}\sqrt{\tan x} + c$ (4) $\frac{1}{4}\sqrt{\tan x} + c$

83. $\int \frac{e^{6\log x} - e^{5\log x}}{e^{4\log x} - e^{3\log x}} dx$ is

(1) $x + c$ (2) $\frac{x^3}{3} + c$ (3) $\frac{3}{x^3} + c$ (4) $\frac{1}{x^2} + c$

84. $\int \tan^{-1}\sqrt{\frac{1-\cos 2x}{1+\cos 2x}} dx$ is

(1) $x^2 + c$ (2) $2x^2 + c$ (3) $\frac{x^2}{2} + c$ (4) $-\frac{x^2}{2} + c$

85. $\int \frac{x^2 + \cos^2 x}{x^2+1} \operatorname{cosec}^2 x dx$ is

(1) $\cot x + \sin^{-1} x + c$ (2) $-\cot x + \tan^{-1} x + c$ (3) $-\tan x + \cot^{-1} x + c$ (4) $-\cot x - \tan^{-1} x + c$

86. $\int \sqrt{\frac{1-x}{1+x}} dx$ is

(1) $\sqrt{1-x^2} + \sin^{-1} x + c$ (2) $\sin^{-1} x - \sqrt{1-x^2} + c$ (3) $\log|x + \sqrt{1-x^2}| - \sqrt{1-x^2} + c$ (4) $\sqrt{1-x^2} + \log|x + \sqrt{1-x^2}| + c$

87. $\int \frac{\sec^2 x}{\tan^2 x - 1} dx$

(1) $2\log\left|\frac{1-\tan x}{1+\tan x}\right| + c$ (2) $\log\left|\frac{1+\tan x}{1-\tan x}\right| + c$ (3) $\frac{1}{2}\log\left|\frac{\tan x+1}{\tan x-1}\right| + c$ (4) $\frac{1}{2}\log\left|\frac{\tan x-1}{\tan x+1}\right| + c$

88. $\int \sin\sqrt{x} dx$ is

(1) $2(-\sqrt{x}\cos\sqrt{x} + \sin\sqrt{x}) + c$ (2) $2(-\sqrt{x}\cos\sqrt{x} - \sin\sqrt{x}) + c$
(3) $2(-\sqrt{x}\sin\sqrt{x} - \cos\sqrt{x}) + c$ (4) $2(-\sqrt{x}\sin\sqrt{x} + \cos\sqrt{x}) + c$

89. A number is selected from the set {1,2,3,...,20}. The probability that the selected number is divisible by 3 or 4 is

(1) $\frac{2}{5}$ (2) $\frac{1}{8}$ (3) $\frac{1}{2}$ (4) $\frac{2}{3}$

90. Two items are chosen from a lot containing twelve items of which four are defective, then the probability that at least one of the item is defective

(1) $\frac{19}{33}$ (2) $\frac{17}{33}$ (3) $\frac{23}{33}$ (4) $\frac{13}{33}$

91. A letter is taken at random from the letters of the word 'ASSISTANT' and another letter is taken at random from the letters of the word 'STATISTICS'. The probability that the selected letters are the same is

(1) $\frac{7}{45}$ (2) $\frac{17}{90}$ (3) $\frac{29}{90}$ (4) $\frac{19}{90}$

92. A bag contains 6 green, 2 white, and 7 black balls. If two balls are drawn simultaneously, then the Probability that both are different colours is

(1) $\frac{46}{105}$ (2) $\frac{71}{105}$ (3) $\frac{34}{105}$ (4) $\frac{23}{105}$

93. A number x is chosen at random from the first 100 natural numbers. Let A be the event of numbers which satisfies $\frac{(x-10)(x-50)}{x-30} \geq 0$, then P(A) is

(1) 0.20 (2) 0.51 (3) 0.71 (4) 0.70

94. If two events A and B are such that $P(\bar{A}) = \frac{3}{10}$ and $P(A \cap \bar{B}) = \frac{1}{2}$, then $P(A \cap B)$ is

(1) $\frac{1}{2}$ (2) $\frac{1}{3}$ (3) $\frac{1}{4}$ (4) $\frac{1}{5}$

95. Ten coins are tossed. The probability of getting at least 8 heads is

(1) $\frac{7}{64}$ (2) $\frac{7}{32}$ (3) $\frac{7}{16}$ (4) $\frac{7}{128}$

96. If m is a number such that $m \leq 5$, then the probability that quadratic equation $2x^2 + 2mx + m + 1 = 0$ has real roots is

(1) $\frac{1}{5}$ (2) $\frac{2}{5}$ (3) $\frac{3}{5}$ (4) $\frac{4}{5}$

97. If ABCD is a parallelogram, then $\overrightarrow{AB} + \overrightarrow{AD} + \overrightarrow{CB} + \overrightarrow{CD}$ is equal to

(a) $2(\overrightarrow{AB} + \overrightarrow{AD})$ (b) $4\overrightarrow{AC}$ (c) $4\overrightarrow{BD}$ (d) $\vec{0}$

98. The number of relations on a set containing 3 element is (1) 9 (2) 81 (3) 512 (4) 1024

99. The value of $\log_3 11 \cdot \log_{11} 13 \cdot \log_{13} 15 \cdot \log_{15} 27 \cdot \log_{27} 81$ is

(1) 4 (2) 3 (3) 1 (4) 2

100. If $\tan 40° = \lambda$, then $\frac{\tan 140° - \tan 130°}{1 + \tan 140° \tan 130°} =$

(1) $\frac{1-\lambda^2}{\lambda}$ (2) $\frac{1+\lambda^2}{\lambda}$ (3) $\frac{1+\lambda^2}{2\lambda}$ (4) $\frac{1-\lambda^2}{2\lambda}$