BALALOK MATRICULATION HIGHER SEC. SCHOOL - CHENNAI

Class:11 **ONE MARK EXAMINATION-SEPTEMBER-2022** **BUSINESS MATHS** - [ANSWER KEY] Max. Marks : 100

I. Choose the correct or the most suitable answer from the given four alternatives.

(b) 1. The value of x if $\begin{vmatrix} 0 & 1 & 0 \\ x & 2 & x \\ 1 & 3 & x \end{vmatrix} = 0$ is
(a) 0, -1 [(b)] 0, 1 (c) -1, 1 (d) -1, -1

(d) 2. The value of $\begin{vmatrix} 2x+y & x & y \\ 2y+z & y & z \\ 2z+x & z & x \end{vmatrix}$ is
(a) x y z (b) x + y + z (c) 2x + 2y + 2z [(d)] 0

(b) 3. If $\Delta = \begin{vmatrix} 1 & 2 & 3 \\ 3 & 1 & 2 \\ 2 & 3 & 1 \end{vmatrix}$ then $\begin{vmatrix} 3 & 1 & 2 \\ 1 & 2 & 3 \\ 2 & 3 & 1 \end{vmatrix}$ is
(a) Δ [(b)] $-\Delta$ (c) 3Δ (d) -3Δ

(c) 4. The value of the determinant $\begin{vmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{vmatrix}^2$ is
(a) abc (b) 0 [(c)] $a^2b^2c^2$ (d) -abc

(c) 5. adj(AB) is equal to
(a) adjA adjB (b) $adjA^T\ adjB^T$ [(c)] adjB adjA (d) $adjB^T\ adjA^T$

(c) 6. The inverse matrix of $\begin{pmatrix} \frac{4}{5} & \frac{-5}{12} \\ \frac{-2}{5} & \frac{1}{2} \end{pmatrix}$ is
(a) 7/30 $\begin{pmatrix} \frac{1}{2} & \frac{5}{12} \\ \frac{2}{5} & \frac{4}{5} \end{pmatrix}$ (b) 7/30 $\begin{pmatrix} \frac{1}{2} & \frac{-5}{12} \\ \frac{-2}{5} & \frac{1}{5} \end{pmatrix}$ [(c)] 30/7 $\begin{pmatrix} \frac{1}{2} & \frac{5}{12} \\ \frac{2}{5} & \frac{4}{5} \end{pmatrix}$ (d) 30/7 $\begin{pmatrix} \frac{1}{2} & \frac{-5}{12} \\ \frac{-2}{5} & \frac{4}{5} \end{pmatrix}$

(d) 7. The number of Hawkins-Simon conditions for the viability of an input-output analysis is
(a) 1 (b) 3 (c) 4 [(d)] 2

(c) 8. The inventor of input-output analysis is
(a) Sir Francis Galton (b) Fisher [(c)] Prof. Wassily W.Leontief (d) Arthur Caylay

(c) 9. If $A = \begin{pmatrix} -1 & 2 \\ 1 & -4 \end{pmatrix}$ then A(adj A) is
(a) $\begin{pmatrix} -4 & -2 \\ -1 & -1 \end{pmatrix}$ (b) $\begin{pmatrix} 4 & -2 \\ -1 & 1 \end{pmatrix}$ [(c)] $\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$ (d) $\begin{pmatrix} 0 & 2 \\ 2 & 0 \end{pmatrix}$

(c) 10. The value of $\begin{vmatrix} 5 & 5 & 5 \\ 4x & 4y & 4z \\ -3x & -3y & -3z \end{vmatrix}$ is
(a) 5 (b) 4 [(c)] 0 (d) -3

(b) 11. If A is an invertible matrix of order 2 then $\det(A^{-1})$ be equal to
(a) det(A) [(b)] 1/det(A) (c) 1 (d) 0

(d) 12. If A is a square matrix of order 3 and |A| = 3 then |adjA| is equal to
(a) 81 (b) 27 (c) 3 [(d)] 9

(d) 13. If $\Delta = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$ and A_{ij} is cofactor of a_{ij}, then value of Δ is given by
(a) $a_{11}A_{31} + a_{12}A_{32} + a_{13}A_{33}$ (b) $a_{11}A_{11} + a_{12}A_{21} + a_{13}A_{31}$ (c) $a_{21}A_{11}+a_{22}A_{12}+a_{23}A_{13}$ [(d)] $a_{11}A_{11} + a_{21}A_{21} + a_{31}A_{31}$

(d) 14. If $\begin{vmatrix} x & 2 \\ 8 & 5 \end{vmatrix} = 0$ then the value of x is
(a) -5/6 (b) 5/6 (c) -16/5 [(d)] 16/5

(b) 15. If $\begin{vmatrix} 4 & 3 \\ 3 & 1 \end{vmatrix} = -5$ then the value of $\begin{vmatrix} 20 & 15 \\ 15 & 5 \end{vmatrix}$ is
(a) -5 [(b)] -125 (c) -25 (d) 0

(a) 16. If any three rows or columns of a determinant are identical then the value of the determinant is
[(a)] 0 (b) 2 (c) 1 (d) 3

(c) 17. The minor of 4 in $\begin{vmatrix} 1 & -2 \\ 4 & 3 \end{vmatrix}$ is -2, then the co-factor of 4 is
(a) 1 (b) -2 [(c)] 2 (d) 3 [Example 1.2]

(a) 18. The adjoint of identity matrix is ___
(a) 1 (b) -1 (c) 0 (d) none of the above

(d) 19. If $|A|_{2x2} = -2$, when $|5A|$ will be_____
(a) +10 (b) -10 (c) +50 (d) -50

(b) 20. The system of equations such as x + y = 1 and x - y = 1 then the value of unknowns will be _____
(a) (-1,0) (b) (1,0) (c) (0,1) (d) (0,-1)

(c) 21. The value of n, when $np_2 = 20$ is
(a) 3 (b) 6 (c) 5 (d) 4

(d) 22. The number of ways selecting 4 players out of 5 is
(a) 4! (b) 20 (c) 25 (d) 5

(c) 23. If $nP_r = 720(nC_r)$, then r is equal to
(a) 4 (b) 5 (c) 6 (d) 7

(a) 24. The possible out comes when a coin is tossed five times
(a) 2^5 (b) 5^2 (c) 10 (d) 5/2

(d) 25. The greatest positive integer which divide n(n+1)(n+2)(n+3) for all $n \in N$ is
(a) 2 (b) 6 (c) 20 (d) 24

(b) 26. For all n>0, $nC_1 + nC_2 + nC_3 + \ldots + nC_n$ is equal to
(a) 2^n (b) 2^n-1 (c) n^2 (d) n^2-1

(c) 27. The term containing x^3 in the expansion of $(x-2y)^7$ is
(a) 3rd (b) 4th (c) 5th (d) 6th

(d) 28. The constant term in the expansion of $(x + 2/x)^6$ is
(a) 156 (b) 165 (c) 162 (d) 160

(b) 29. The last term in the expansion of $(3 + \sqrt{2})^8$ is
(a) 81 (b) 16 (c) $8\sqrt{2}$ (d) $27\sqrt{3}$

(a) 30. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines is
(a) 18 (b) 12 (c) 9 (d) 6

(c) 31. There are 10 true or false questions in an examination. Then these questions can be answered in
(a) 240 ways (b) 120 ways (c) 1024 ways (d) 100 ways

(a) 32. The value of $(5C_0 + 5C_1) + (5C_1 + 5C_2) + (5C_2 + 5C_3) + (5C_3 + 5C_4) + (5C_4 + 5C_5)$ is
(a) $2^6 - 2$ (b) $2^5 - 1$ (c) 2^8 (d) 2^7

(a) 33. The number of ways to arrange the letters of the word "CHEESE"
(a) 120 (b) 240 (c) 720 (d) 6

(b) 34. Thirteen guests has participated in a dinner. The number of handshakes happened in the dinner is
(a) 715 (b) 78 (c) 286 (d) 13

(d) 35. Sum of Binomial co-efficient in a particular expansion is 256, then number of terms in the expansion is
(a) 8 (b) 7 (c) 6 (d) 9

(a) 36. Sum of the binomial coefficients is
(a) 2^n (b) n^2 (c) 2n (d) n+17

(d) 37. The value of B in $\frac{1}{x^2-1} = \frac{½}{x-1} + \frac{B}{x+1}$ is ____
(a) +1 (b) - 1 (c) ½ (d) -½ Example 2.1

(d) 38. There are 4 questions in a paper each one having 4 choices separately. In how many ways a student can answer correctly for only one question?
(a) 16 (b) 4 (c) 64 (d) 256 Example 2.12

(b) 39. If $4c_3 + 4c_2 = 5c_3$ then $8c_3 + 8c_2$ = _____
(a) $9c_2$ (b) $9c_3$ (c) $8c_3$ (d) $9c_5$

(c) 40. The sum of coefficients of even terms in expansion of $(1 + x)^3$ is _____
(a) 2 (b) 1 (c) 4 (d) 8

(b) 41. If m_1 and m_2 are the slopes of the pair of lines given by $ax^2 + 2hxy + by^2 = 0$, then the value of $m_1 + m_2$ is ____
(a) 2h/b (b) -2h/b (c) 2h/a (d) -2h/a

(c) 42. If the lines 2x - 3y - 5 = 0 and 3x - 4y - 7 = 0 are the diameters of a circle, then its centre is
(a) (-1,1) (b) (1,1) (c) (1,-1) (d) (-1,-1)

(c) 43. The x - intercept of the straight line 3x + 2y - 1 = 0 is
(a) 3 (b) 2 (c) 1/3 (d) ½

(b) 44. The slope of the line 7x + 5y - 8 = 0 is
(a) 7/5 (b) -7/5 (c) 5/7 (d) -5/7

(c) 45. The locus of the point P which moves such that P is at equidistance from their coordinate axes is
(a) y = 1/x (b) y = -x (c) y = x (d) y = -1/x

Pg. No:8 NOTE(V)
$|KA| = K^2|A|$ (2×2)
$|5A| = 5^2(-2)$
$= 25(-2)$
$= -50$

$2^{n-1} = 2^{3-1} = 2^2 = 4$

[c] 46. If $kx^2 + 3xy - 2y^2 = 0$ represent a pair of lines which are perpendicular then k is equal to
(a) ½ (b) -½ (c) 2 (d) -2

(a) 47. (1,-2) is the centre of the circle $x^2 + y^2 + ax + by - 4 = 0$, then its radius
(a) 3 (b) 2 (c) 4 (d) 1

(b) 48. The length of the tangent from (4,5) to the circle $x^2 + y^2 = 16$ is
(a) 4 (b) 5 (c) 16 (d) 25

(a) 49. Length of the latus rectum of the parabola $y^2 = -25x$
(a) 25 (b) -5 (c) 5 (d) -25

(a) 50. The equation of the circle with centre on the x axis and passing through the origin is
(a) $x^2 - 2ax + y^2 = 0$ (b) $y^2 - 2ay + x^2 = 0$ (c) $x^2 + y^2 = a^2$ (d) $x^2 - 2ay + y^2 = 0$

(a) 51. If the centre of the circle is (-a, -b) and radius is $\sqrt{a^2 - b^2}$, then the equation of circle is
(a) $x^2+y^2+2ax+2by+2b^2=0$ (b) $x^2+y^2+2ax+2by-2b^2=0$ (c) $x^2+y^2-2ax-2by-2b^2=0$ (d) $x^2+y^2-2ax-2by+2b^2=0$

(d) 52. Combined equation of co-ordinate axes is
(a) $x^2-y^2 = 0$ (b) $x^2+y^2 = 0$ (c) $xy=c$ (d) $xy=0$

(a) 53. If the circle touches x axis, y axis and the line x = 6 then the length of the diameter of the circle is
(a) 6 (b) 3 (c) 12 (d) 4

(d) 54. The eccentricity of the parabola is
(a) 3 (b) 2 (c) 0 (d) 1

(b) 55. The double ordinate passing through the focus is
(a) focal chord (b) latus rectum (c) directrix (d) axis

(b) 56. The distance between directrix and focus of a parabola $y^2 = 4ax$ is
(a) a (b) 2a (c) 4a (d) 3a

(b) 57. The y-intercept of the straight line $\frac{x}{3} + \frac{y}{4} = 1$ is ____
(a) 3 (b) 4 (c) 1 (d) 12

(a) 58. The centre of equation of circle $(x-3)^2 + (y+1)^2 = 16$ is ____ Example 3.17
(a) (3,-1) (b) (1,3) (c) (1,-3) (d) (-3,1)

(c) 59. The Cartesian equation of the circle whose parametric equations are $x = 3\cos\theta$; $y = 3\sin\theta$, $0 \le \theta \le 2\pi$ is ____ Ex 3.4 [9]
(a) $3\cos^2\theta + 3\sin^2\theta$ (b) $9\cos\theta\sin\theta$ (c) $x^2 + y^2 = 9$ (d) $x^2 + y^2 = 3$

(a) 60. If e=1, the conic is said to be ____
(a) Parabola (b) ellipse (c) hyperbola (d) rectangular hyperbola

(b) 61. The degree measure of π/8 is
(a) 20°60′ (b) 22°30′ (c) 22°60′ (d) 20°30′

(c) 62. If $\tan\theta = 1/\sqrt{5}$ and θ lies in the first quadrant then $\cos\theta$ is
(a) $1/\sqrt{6}$ (b) $-1/\sqrt{6}$ (c) $\sqrt{5}/\sqrt{6}$ (d) $-\sqrt{5}/\sqrt{6}$

(b) 63. The value of sin (-420°) is
(a) $\sqrt{3}/2$ (b) $-\sqrt{3}/2$ (c) ½ (d) - ½

(d) 64. The value of cos (-480°) is
(a) $\sqrt{3}$ (b) $-\sqrt{3}/2$ (c) ½ (d) - ½

(d) 65. The value of $\sin 15^0 \cos 15^0$ is
(a) 1 (b) ½ (c) $\sqrt{3}/2$ (d) ¼

(a) 66. The value of $\sec A \sin(270^0 + A)$ is
(a) -1 (b) $\cos^2 A$ (c) $\sec^2 A$ (d) 1

(c) 67. If sinA + cosA = 1 then sin2A is equal to
(a) 1 (b) 2 (c) 0 (d) ½

(d) 68. The value of $1 - 2\sin^2 45^0$ is
(a) 1 (b) ½ (c) ¼ (d) 0²

(b) 69. If sin A = ½ then $4\cos^3 A - 3\cos A$ is
(a) 1 (b) 0 (c) $\sqrt{3}/2$ (d) $1/\sqrt{2}$

(a) 70. The value of $\frac{3\tan 10^0 - \tan^3 10^0}{1 - 3\tan^2 10^0}$ is
(a) $1/\sqrt{3}$ (b) ½ (c) $\sqrt{3}/2$ (d) $1/\sqrt{2}$

(b) 71. $\sec^{-1} 2/3 + \text{cosec}^{-1} 2/3 =$
(a) $-\pi/2$ (b) $\pi/2$ (c) π (d) $-\pi$

(c) 72. If tanA = ½ and tanB = 1/3 then tan (2A+B) is equal to
(a) 1 (b) 2 (c) 3 (d) 4

(c) 73. $\sin(\cos^{-1} 3/5)$ is
(a) 3/5 (b) 5/3 (c) 4/5 (d) 5/4

(a) 74. The value of 1 / cosec(-45°) is
(a) $-1/\sqrt{2}$ (b) $1/\sqrt{2}$ (c) $\sqrt{2}$ (d) $-\sqrt{2}$

(b) 75. The p $\sec 50^0 = \tan 50^0$ then p is
(a) $\cos 50^0$ (b) $\sin 50^0$ (c) $\tan 50^0$ (d) $\sec 50^0$

(d) 76. $\left(\frac{\cos x}{\operatorname{cosec} x}\right) - \sqrt{1 - \sin^2 x}\,\sqrt{1 - \cos^2 x}$ is
(a) $\cos^2 x - \sin^2 x$ (b) $\sin^2 x - \cos^2 x$ (c) 1 (d) 0

(a)(b) * 77. The value of $\sec(-50^0)$ is ____
(a) $\sec 50^0$ (b) $\sec 50^0$ (c) $-\sec 50^0$ (d) $\cos 50^0$

(b) 78. The value of $\operatorname{cosec}^{-1}(\operatorname{cosec} \pi/2)$ = ____
(a) $\pi/4$ (b) $\pi/2$ (c) $\pi/3$ (d) π

(c) 79. $\cos^2 30^0 - \sin^2 30^0$ = ____
(a) ¼ (b) $1/\sqrt{2}$ (c) ½ (d) $\sqrt{3}/2$

(d) 80. $\tan^2 45^0 - \sec^2 45^0$ = ____
(a) 1 (b) 0 (c) $1/\sqrt{2}$ (d) -1

(c) 81. If $f(x) = \begin{cases} x^2 - 4x & \text{if } x \geq 2 \\ x + 2 & \text{if } x < 2 \end{cases}$, then f(5) is
(a) -1 (b) 2 (c) 5 (d) 7

(a) * 82. If $f(x) = \begin{cases} x^2 - 4x & \text{if } x \geq 2 \\ x + 2 & \text{if } x < 2 \end{cases}$, then f(0) is
(a) +2 (b) 5 (c) -1 (d) 0

(a) 83. The graph of the line y = 3 is
(a) parallel to x - axis (b) parallel to y - axis (c) passing through the origin (d) perpendicular to x - axis

(a) 84. The graph of $y = 2x^2$ is passing through
(a) (0,0) (b) (2,1) (c) (2,0) (d) (0,2)

(c) 85. The graph of $y = e^x$ intersect the y axis at
(a) (0,0) (b) (1,0) (c) (0,1) (d) (1,1)

(a) 86. The minimum value of the function f(x) = |x| is
(a) 0 (b) -1 (c) +1 (d) $-\infty$

(a) 87. If $f(x) = 2^x$ and $g(x) = 1/2^x$, then (fg)(x) is
(a) 1 (b) 0 (c) 4^x (d) $1/4^x$

(a) 88. Which of the following function is neither even nor odd?
(a) $f(x) = x^3 + 5$ (b) $f(x) = x^5$ (c) $f(x) = x^{10}$ (d) $f(x) = x^2$

(a) 89. The graph of $f(x) = e^x$ is identical to that to
(a) $f(x) = a^x$, $a > 1$ (b) $f(x) = a^x$, $a < 1$ (c) $f(x) = a^x$, $0 < a < 1$ (d) $y = ax+b$, $a \neq 0$

(a) 90. If $f(x) = x^2$ and $g(x) = 2x+1$, then (fg)(0) is
(a) 0 (b) 2 (c) 1 (d) 4

(c) 91. $\lim_{x \to 0} \frac{e^x - 1}{x}$ =
(a) e (b) nx^{n-1} (c) 1 (d) 0

(b) 92. For what value of x, $f(x) = \frac{x + 2}{x - 1}$ is not continuous?
(a) -2 (b) 1 (c) 2 (d) -1

(a) 93. $\frac{d}{dx}\left(\frac{1}{x}\right)$ is equal to
(a) $-1/x^2$ (b) $-1/x$ (c) $\log x$ (d) $1/x^2$

(a) 94. d/dx ($5e^x$ - 2 logx) is equal to
(a) $5e^x - 2/x$ (b) $5e^x - 2x$ (c) $5e^x - 1/x$ (d) $2\log x$

(a) 95. If $y = e^{2x}$, then d^2y/dx^2 at x = 0 is
(a) 4 (b) 9 (c) 2 (d) 0

(d) 96. $d/dx(a^x)$ =
(a) $1/x\log_e a$ (b) a^a (c) $x\log_e a$ (d) $a^x\log_e a$

(c) 97. Pick out the explicit function
(a) $y = e^x + e^{-x}$ (b) y = 3 (c) $x^3 + y^3 - xy = 0$ (d) $x^2 - 2xy + y^2 = 0$

(c) 98. $\lim_{x \to 0} \frac{\sin 2x}{2x}$ =
(a) 0 (b) 2x (c) 1 (d) -1

(d) 99. d/dx (3x+2) = ____
(a) 3x+2 (b) 2 (c) 1 (d) 3

(c) 100. If y = logx, then y_3 = ____
(a) 1/x (b) $-1/x^2$ (c) $2/x^3$ (d) $-2/x^2$

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