

Set – E

- (1) The latus vectum of the parabola $x^2 - 4x - 2y - 8 = 0$ is _____
(a) 8 (b) 4 (c) 2 (d) 1
- (2) For a 3×3 matrix A, if $\det A = 4$, then $|\text{Adj}A|$ equals _____
(a) -4 (b) 4 (c) 16 (d) 64
- (3) If two vectors $\vec{a}$ and $\vec{b}$ be such that $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$, then the angle between $\vec{a}$ and $\vec{b}$ is _____
(a) 60° (b) 180° (c) 90° (d) 0°
- (4) If $\cos\alpha, \cos\beta, \cos\gamma$ are the direction cosines of a line, then the value of $\sin^2\alpha + \sin^2\beta + \sin^2\gamma$ is _____
(a) 1 (b) 2 (c) 3 (d) 4
- (5) The maximum number of points of intersection of 8 circles is _____
(a) 16 (b) 24 (c) 28 (d) 56
- (6) $\lim_{x \rightarrow 0} \frac{a^x - 1}{\sqrt{1+x} - 1}$ is equal to _____
(a) $2 \log_e a$ (b) $\frac{1}{2} \log_e a$ (c) $a \log_e 2$ (d) None of these
- (7) The smallest positive integer n for which $\left(\frac{1+i}{1-i}\right)^n = -1$ is _____
(a) 1 (b) 2 (c) 3 (d) 4
- (8) If $\sin\left(\sin^{-1}\frac{1}{5} + \cos^{-1}x\right) = 1$, then x is equal to _____
(a) 1 (b) 0 (c) $\frac{4}{5}$ (d) $\frac{1}{5}$
- (9) The minimum value of the function $y = 2x^3 - 21x^2 + 36x - 20$ is _____
(a) -128 (b) -126 (c) -120 (d) None of

- (10) The number of different matrices that can be formed with elements 0, 1, 2, or 3 each having 4 elements is
- (a) 3×2^4 (b) 2×4^4 (c) 3×4^4 (d) 4^4
- (11) The number of terms in the expansion of $(2x + 3y - 4z)^n$ is _____
- (a) $n + 1$ (b) $n + 3$ (c) $\frac{(n+1)(n+2)}{2}$ (d) None of these
- (12) Let $n(u) = 700$, $n(A) = 200$, $n(B) = 300$ and $n(A^c \cap B^c) =$ _____
- (a) 400 (b) 600 (c) 300 (d) 200
- (13) Let $E = \{1, 2, 3, 4\}$ and $F = \{1, 2\}$ then the number of onto functions from E to F is _____
- (a) 14 (b) 16 (c) 12 (d) 8
- (14) The image of the point $(4, -13)$ in the line $5x + y + 6 = 0$ is _____
- (a) $(-1, -14)$ (b) $(3, 4)$ (c) $(1, 2)$ (d) $(-4, 13)$
- (15) $\int \sec^3 x \, dx$ is equal to _____
- (a) $\frac{1}{2} \tan x \sec x$ (b) $\frac{1}{2} \log |\sec x + \tan x|$
- (b) $\frac{1}{2} \sec x \tan x + \frac{1}{2} \log |\sec x + \tan x|$ (d) None of these.
- (16) The number of ways in which four left terms of the word MATHEMATICS can be arranged is given by _____
- (a) 136 (b) 192 (c) 1680 (d) 2454
- (17) The line $3x - 4y = \lambda$ touches the circle $x^2 + y^2 - 4x - 8y - 5 = 0$ if the value of λ is
- (a) 20 (b) 15 (c) 10 (d) 5
- (18) $\int_0^\pi \sin^2\left(\frac{x}{2}\right) dx$ equals _____
- (a) $\frac{16}{15}$ (b) $\frac{32}{15}$ (c) $\frac{8}{15}$ (d) $\frac{5}{6}$

(19) The value of λ for which the equation $x^2 - \lambda xy + 2y^2 + 3x - 5y + 2 = 0$ may represent a pair of straight lines is _____

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

(20) If the sum of two unit vectors is a unit vector, then the magnitude of their difference is _____

- (a) $\sqrt{2}$ (b) $\sqrt{3}$ (c) 2 (d) $\sqrt{5}$

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