Set-C

(1) The latus rectum of the hyperbola $16x^2 - 9y^2 = 144$ is _____

(a) $\dfrac{16}{3}$ (b) $\dfrac{32}{3}$ (c) $\dfrac{8}{3}$ (d) $\dfrac{4}{3}$

(2) For any 2×2 matrix A, if $A(\text{Adj}A) = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$, then $|A|$ is _____

(a) 0 (b) 10 (c) 20 (d) 100

(3) If $\left(\vec{a} \times \vec{b}\right)^2 + \left(\vec{a}.\vec{b}\right)^2 = 144$ and $|\vec{a}| = 4$, then $|\vec{b}| = $ _____

(a) 16 (b) 8 (c) 3 (d) 12

(4) The perpendicular distance of the point (2, 4, -1) from the line $\dfrac{x+5}{1} = \dfrac{y+3}{4} = \dfrac{z-6}{-9}$ is _____

(a) 3 (b) 5 (c) 7 (d) 9

(5) A polygon has 44 diagonals. The number of its sides are _____

(a) 10 (b) 11 (c) 12 (d) 13

(6) $\lim\limits_{x \to 0} \dfrac{\log(1+ax) + \log(1+bx)}{x}$ is equal to _____

(a) $a - b$ (b) $a + b$ (c) ab (d) $\dfrac{a}{b}$

(7) If $(i+i)^{100} = 2^{49}(x+iy)$, then $x^2 + y^2 = $ _____

(a) 16 (b) 8 (c) 4 (d) 2

(8) $\sec^2\left(\tan^{-1} 2\right) + \csc^2\left(\cot^{-1} 3\right) = \ldots$

(a) 5 (b) 10 (c) 25 (d) 20

(9) Let $f(x) = x^3 - 6x^2 + 9x + 8$, then $f(x)$ is strictly increasing in

(a) $(-\infty, 2)$ (b) $(1, 3)$ (c) $(3, \infty)$ (d) $(-\infty, 1) \cup (3, \infty)$

(10) The number of terms in the expansion of $(x+y)^{100} + (x-y)^{100}$ after simplification is _____

(a) 50 (b) 51 (c) 202 (d) none of these.

(11) Two finite sets have m and n elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. The values of m and n are

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

(13) If the set A has p elements, B has q elements, then the number of elements in A ×B is _____

    (a) p+q   (b) p+q+1   (c) pq   (d) p^2

(14) The fourth vertex of the squre formed by the points (2, 2), (4,3), (-2, 5) is _____

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

(15) $\int \dfrac{xe^x}{(1+x)^2}dx$ is equal to

    (a) $\dfrac{-e^x}{1+x}$ (b) $\dfrac{(1+2x)e^x}{1+x}$ (c) $\dfrac{(-1+2x)e^x}{1+x}$ (d) $\dfrac{e^x}{1+x}$

(16) The probability that a loop year selected at random will contain 53 Sundays is _____

    (a) $\dfrac{1}{7}$ (b) $\dfrac{2}{7}$ (c) $\dfrac{6}{7}$ (d) $\dfrac{3}{7}$

(17) The value of $\int_{0}^{\pi/2} e^{\sin x} \cos x \, dx$ is _____

    (a) 0   (b) 1   (c) -1 (d) $e-1$

(18) $\lim\limits_{x \to -\pi/4} \dfrac{1+\tan x}{\cos 2x}$ is _____

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

(19) If the mean of 1, 2, 3…. N is $\dfrac{6n}{11}$, then n is _____

    (a) 10   (b) 12   (c) 11   (d) 13

(20) The area bounded by the cure $y^2 = 2x$ and the lines $x=1$, $x=4$ and $y=0$ in the first quadrant is _____

    (a) 7   (b) 14   (c) 28   (d) $\dfrac{14}{3}$