

Q.1 The domain of the function $f(x) = 1/(2 - \cos 3x)$ is

- (a) $(1/3, 1)$
- (b) $[1/3, 1]$
- (c) $(1/3, 1]$
- (d) \mathbb{R}

Q.2 The value of $\cos 420^\circ$ is

- (a) 0
- (b) 1
- (c) $1/2$
- (d) $\sqrt{3}/2$

Q.3 If $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then the value of $\cot(A - B)$ is

- (a) $x + y$
- (b) $1/x + y$
- (c) $x + 1/y$
- (d) $1/x + 1/y$

Q.4 The modulus of $1 + i\sqrt{3}$ is

- (a) 1
- (b) 2
- (c) 3
- (d) None of these

Q.5 In the binomial expansion of $(a + b)^n$, the coefficient of fourth and thirteenth terms are equal to each other, then the value of n is

- (a) 10
- (b) 15
- (c) 20
- (d) 25

Q.6 The number of ordered triplets of positive integers which are solution of the equation $x + y + z = 100$ is

- (a) 4815
- (b) 4851
- (c) 8451
- (d) 8415

Q.7 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

Q.8 If A is any square matrix of order 3×3 such that $|a| = 3$, then the value of $|\text{adj. } A|$ is?

- (a) 3
- (b) 13
- (c) 9
- (d) 27

Q.9 Find the area of the triangle with vertices $P(4, 5)$, $Q(4, -2)$ and $R(-6, 2)$.

- (a) 21 sq. units
- (b) 35 sq. units
- (c) 30 sq. units
- (d) 40 sq. units

Q.10 Let $f: (-1, 1) \rightarrow \mathbb{R}$ be a differentiable function with $f(0) = -1$ and $f'(0) = 1$. Let $g(x) = [f(2f(x) + 2)]^2$. Then $g'(0) =$

- (a) 4
- (b) -4
- (c) $\log 2$
- (d) $-\log 2$

Q.11 Derivative of $\cot x^\circ$ with respect to x is

- (a) $\text{cosec } x^\circ$
- (b) $\text{cosec } x^\circ \cot x^\circ$
- (c) $-\text{cosec}^2 x^\circ$
- (d) $-\text{cosec } x^\circ \cot x^\circ$

Q.12 Evaluate: $\int (2 \tan x - 3 \cot x)^2 dx$

- (a) $-4 \tan x - \cot x - 25x + C$
- (b) $4 \tan x - 9 \cot x - 25x + C$
- (c) $-4 \tan x + 9 \cot x + 25x + C$
- (d) $4 \tan x + 9 \cot x + 25x + C$

Q.13 $\int \cot^2 x dx$ equals to

- (a) $\cot x - x + C$
- (b) $\cot x + x + C$
- (c) $-\cot x + x + C$
- (d) $-\cot x - x + C$

Q.14 The points with position vectors $(2, 6)$, $(1, 2)$ and $(a, 10)$ are collinear if the value of a is

- (a) -8
- (b) 4
- (c) 3
- (d) 12

Q.15 $|a \times b|^2 + |a \cdot b|^2 = 144$ and $|a| = 4$, then $|b|$ is equal to

- (a) 12
- (b) 3
- (c) 8
- (d) 4

Q.16 The equation of the plane through the origin and parallel to the plane $3x - 4y + 5z + 6 = 0$

- (a) $3x - 4y - 5z - 6 = 0$
- (b) $3x - 4y + 5z + 6 = 0$
- (c) $3x - 4y + 5z = 0$
- (d) $3x + 4y - 5z + 6 = 0$

Q.17 The area of the quadrilateral ABCD, where A(0, 4, 1), B(2, 3, -1), C(4, 5, 0) and D(2, 6, 2), is equal to

- (a) 9 sq. units
- (b) 18 sq. units
- (c) 27 sq. units
- (d) 81 sq. units

Q.18 Let A and B be two events. If $P(A) = 0.2$, $P(B) = 0.4$, $P(A \cup B) = 0.6$, then $P(A/B)$ is equal to:

- (a) 0.8
- (b) 0.5
- (c) 0.3
- (d) 0

Q.19 Region represented by $x \geq 0$, $y \geq 0$ is

- (a) first quadrant
- (b) second quadrant
- (c) third quadrant
- (d) fourth quadrant

Q.20 If a matrix A is both symmetric and skew symmetric then matrix A is

- (a) a scalar matrix
- (b) a diagonal matrix
- (c) a zero matrix of order $n \times n$
- (d) a rectangular matrix

ANSWER KEY

1b

2c

3d

4b

5b

6b

7b

8c

9b

10b

11c

12b

13d

14c

15b

16c

17a

18d

19a

20b