

GUJCET 2024 Question Paper Mar 31 (Mathematics)

Ques 1. Global maximum value of function $f(x) = \sin x + \cos x$, $x \in [0, \pi]$ = _____.

Ans. $\sqrt{2}$

Ques 2. If $x = a(1 - \cos\theta)$, $y = a(\theta + \sin\theta)$, then $dy/dx =$ _____.

Ans. $\cot\theta/2$

Ques 3. $\int [(e^{2x} - 1) / (e^{2x} + 1)] dx =$ _____ + C

Ans. $\log(e^{2x} + 1) - x$

Ques 4. $\int e^x [(1 + \sin x) / (1 - \sin x)] dx =$ _____ + C

Ans. $e^x \tan x/2$

Ques 5. $\int [1 / (4x - x^2)^{1/2}] dx =$ _____ + C

Ans. $\sin^{-1}((x - 2) / 2)$

Ques 6. If $| (2017 \ 2018), (2019 \ 2020) | + | (2021 \ 2022), (2023 \ 2024) | = 2k$, so $k^3 =$ _____.

Ans. -8

Ques 7. If the area of $\triangle PQR$ with vertices $P(k, 1)$, $Q(2, 4)$ and $R(1, 1)$ is 3 square units, then $k =$ _____.

Ans. - 1, 3

Ques 8. If $A = \begin{bmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$ then $I + A^2 =$ _____.

Ans. $2I$

Ques 9. If the value of $\cos \alpha$ is _____, then $A + A' = I$. where $A = \begin{bmatrix} \sin \alpha & -\cos \alpha \\ \cos \alpha & \sin \alpha \end{bmatrix}$

Ans. $\sqrt{3}/2$

Ques 10. If A is a square matrix such that $A^2 = A$, then $(I - A)^3 - (I + A)^2 =$ _____.

Ans. $2(I - 2A)$

Ques 11. $\sin^{-1}(\sin 23\pi/6) =$ _____.

Ans. $-\pi/6$

Ques 12. The value of $\tan^{-1}(-1) + \sec^{-1}(-2) + \sin^{-1}(1/\sqrt{2})$ is _____.

Ans. $2\pi/3$

Ques 13. If $y = \tan^{-1} x$ then _____.

Ans. $-\pi/2 \leq y \leq \pi/2$

Ques 14. If $f : \mathbb{Z} \rightarrow \mathbb{Z}$, $f(x) = x^3 + 2$ is defined, then the function f _____.

Ans. One-by-one

Ques 15. The relation $R = \{(a, a), (b, b), (c, c), (a, c)\}$ defined on the set $\{a, b, c\}$ is _____.

Ans. spontaneous, traditional, but not conformist.

Ques 16. If $P(B) \neq 0$ and $P(A | B) = 1$ for two events A and B , then _____.

Ans. $B \subset C$

Ques 17. If a pair of dice is thrown, the probability of getting an even prime number on each die is _____.

Ans. $1/36$

Ques 18. Given events A and B are absolute and $P(A) = p$, $P(B) = 1/2$ and $P(A \cup B) = 3/5$, the value of p is _____.

Ans. $\frac{1}{5}$

Ques 19. If $x + y \leq 55$ and $x + y \geq 10$, $x \geq 0$, $y \geq 0$ the minimum value of the objective function $z = 7x + 3y$

Ans. Solution region is not feasible, so not found.

Ques 20. If the vertices of the finite feasible solution region are $(0, 6)$, $(3, 3)$, $(9, 9)$, $(0, 12)$, then the maximum value of the objective function $z = 6x + 12y$ _____.

Ans. 162

GUJCET 2024 Answer Key Mar 31 (Mathematics)

Question No.	Answer Key
1	$\sqrt{2}$
2	$\cot\theta/2$
3	$\log (e^{2x} + 1) - x$
4	$e^x \tan x/2$
5	$\sin^{-1} ((x - 2) / 2)$
6	-8
7	- 1, 3
8	2I
9	$\sqrt{3}/2$
10	$2(I - 2A)$
11	- p/6
12	$2p/3$
13	$-\pi/2 \leq y \leq \pi/2$
14	One-by-one
15	spontaneous, traditional, but not conformist.
16	$B \subset C$
17	1/36

18	$\frac{1}{5}$
19	Solution region is not feasible, so not found.
20	162